SPITFIRE II/V VS Bf 109F

Channel Front 1940–42

TONY HOLMES

Author

Osprey Aviation Editor since 1989, Tony Holmes is a native of Fremantle, Western Australia. Responsible for devising the Aircraft of the Aces, Combat Aircraft, Aviation Elite Units, Duel and X-Planes series, Tony has also written more than 25 books for Osprey over the past 30 years.

Illustrators

Jim Laurier is a native of New England, growing up in New Hampshire and Massachusetts. He has been drawing since he could hold a pencil and throughout his life he has worked in many mediums, creating artwork on a variety of subjects. He has worked on the Osprey Aviation list since 2000 and in that time he has produced some of the finest artwork seen in these volumes.

Gareth Hector is a digital artist of international standing as well as an aviation history enthusiast. Gareth, based in Scotland, completed the battlescene and cover artworks for this volume.

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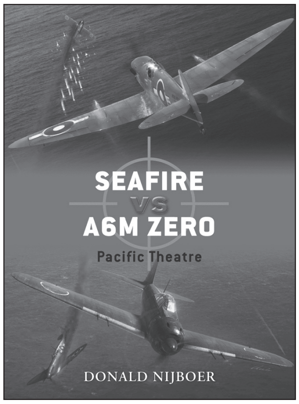
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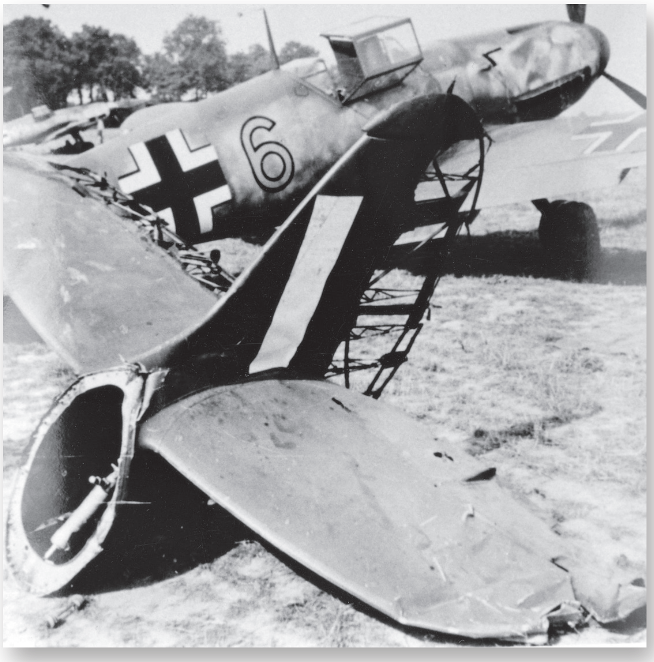

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Spitfire Cover Art

Wg Cdr Douglas Bader, leading the Tangmere Wing in his distinctively marked Spitfire IIA P7966, hits a Bf 109F (probably from JG 2) hard with a well-aimed burst of machine gun fire west-southwest of Lille during 'Circus No. 29' on 2 July 1941. 'I was leading No. 616 Sqn's first section', the legless ace later recounted in his combat report. 'Sighted approximately 15 Me 109Fs a few miles southwest of Lille, so turned south and attacked them. They were in a sort of four formation, climbing eastwards. They made no attempt to do anything but climb in formation, so I turned the squadron behind them and attacked from about 200ft above and behind. I attacked an Me 109F from quarter astern and saw his hood come off – he probably jettisoned it – and the pilot started to climb out. Did not see him actually bale out as I nearly collided with another Me 109 that was passing on my right in the middle of a half-roll.' Bader duly hit this machine too, but only claimed it as damaged. This victory was his 18th success and it was one of 16 credited to Spitfire units that day for the loss of eight fighters and five pilots. (Artwork by Gareth Hector)

Bf 109 Cover Art

Three Spitfire IIs were lost on 12 March 1941 when No. 11 Group's units attempted to combat a series of 'Freie Jagd' (Free Hunt) sweeps conducted by Bf 109s along the Kent coast. No victories were claimed in return. One of the successful pilots was leading Luftwaffe ace Oberstleutnant Werner Mölders, *Kommodore* of JG 51, who bounced Spitfires from No. 74 Sqn near Dungeness during a late afternoon sweep in his Bf 109F-2. His victim was Sgt John Glendinning (flying P7506), whose demise was recorded in the diary of squadronmate Sgt 'Peter' Mays. 'Poor old Glendinning shot down and killed over Folkestone. He was flying as "Tail End Charlie" at the time. I can well remember talking to him whilst he was placing a photograph of his wife and children on the mantelpiece. I said that after only 20 hours on Spitfires and 150 hours in all I found it difficult to cope. "Be patient" he said. "Once you have mastered it it's easy as flying a Tiger Moth!" We all had a soft spot for Glendinning for he was always endeavouring to bolster our spirits, although perhaps he was becoming a little over confident himself.' Assigned to No. 74 Sqn from 21 October 1940, Glendinning had been credited with four victories, one probable and one damaged before his death. The 12 March victory was one of four claimed by Mölders between 20 February and 15 April 1941 which remained unconfirmed. His 70th confirmed success would come the following day, however, when he shot down Spitfire IIA P7555 flown by No. 64 Sqn ace Sqn Ldr Donald MacDonnell during 'Circus No. 7'. The Scotsman spent the rest of the war as a PoW. (Artwork by Gareth Hector)

Author's Note

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INTRODUCTION

The Battle of Britain had seen the Bf 109E pitted against the Hurricane and increasing numbers of Spitfires as German fighter pilots forlornly tried to protect Heinkel, Dornier and Junkers medium bombers targeting southern England. By early October 1940 it was clear that the hitherto invincible Luftwaffe had for the first time failed to achieve its assigned objective – the neutralisation of the Royal Air Force (RAF), which would have allowed the Wehrmacht to invade Britain. With the Luftwaffe forced to switch to a night *Blitz* to reduce the unsustainable losses being suffered by its *Kampfgruppen*, offensive operations during daylight hours increasingly fell to the Bf 109-equipped *Jagdgeschwader* based along the Channel coast in occupied France. Bomb-equipped Bf 109Es and Bf 110s, escorted by yet more E-model Messerschmitts, continued to take the fight to the RAF long after the Battle had officially ended on 31 October – a date observed only by the British.

It was during the autumn that the Luftwaffe introduced a new variant of its standard fighter, the ubiquitous Bf 109E being supplanted – initially in very small numbers only – by the more powerful and aerodynamically refined Bf 109F. Although the first three pre-production examples of the aircraft had been released for service evaluation with JG 51 in early October 1940, many months would pass before the F-model outnumbered the Bf 109E on the Channel Front.

Its main protagonist would, of course, be the Spitfire, initially the Mk I/II and then the Mk V. Like the Messerschmitt, the Supermarine fighter was improved as lessons from the early aerial combat of 1939–40 saw it equipped with a more powerful engine and, eventually, better armament. Most importantly, the RAF would change its tactics as Fighter Command was ordered to go on the offensive from early 1941 once it was clear that Germany had no immediate plans to invade Britain. Its new Commander-in-Chief, Air Chief Marshal (ACM) Sir Sholto Douglas, wanted his squadrons 'leaning forward into France'. The first such mission had actually been performed by two pilots from Spitfire IIA-equipped No. 66 Sqn on 20 December 1940 when they strafed Le Touquet. This was the first time Spitfires had ventured over France since the fall of Dunkirk siz months earlier.

Now the roles would effectively be reversed. Fighter Command would be escorting bombers targeting airfields, ports and industrial infrastructure in northern France and Belgium, as well as performing sweeps aimed at tempting the Luftwaffe up for large-scale dogfights. Spitfire pilots involved in these missions had gone from attacking bombers during the Battle of Britain to defending them over Occupied Europe just a few short months later. These operations were codenamed 'Circuses' (fighter sweeps with bombers as bait), 'Ramrods' (escorted bomber missions where the objective was to destroy the target), 'Rhubarbs' (small-scale fighter strafing missions), 'Rodeos' (sweeps by large formations of fighters) and 'Roadsteads' (attacks on German coastal convoys at sea or in port). The growing number of Spitfire units within Fighter Command were in the vanguard of the action on the Channel Front. But losses mounted as German fighters and flak exacted a heavy toll in men and machines.

A fighter pilot from World War 1, ACM Sir W Sholto Douglas was initially opposed to the suggestion that Fighter Command should go on the offensive over Occupied Europe following the end of the Battle of Britain. (Author)

By the summer of 1941 the 'Circuses' had evolved into large-scale, integrated operations involving up to 300 fighters (primarily Spitfires). These missions were now being generated on a near-daily basis during periods of good weather. Following the German invasion of the Soviet Union in June 1941, the Channel Front was robbed of all but two *Jagdgeschwader* – JG 2 and JG 26. It was the responsibility of these units to defend France and the Low Countries from RAF attacks. Equipped with around 260 Bf 109E/Fs, they achieved a combat score of four-to-one in their favour during the latter half of 1941.

As this volume will show, although Fighter Command had the numerical strength during the Channel Front campaign, it was the Jagdwaffe that enjoyed the greatest success as scores of Spitfire pilots fell victim to their opponents – or to flak – deep inside enemy-held territory.

CHRONOLOGY

1938

Autumn Bayerische Flugzeugwerke design team starts work on a development of the Bf 109E then entering service with the Luftwaffe which will become the Bf 109F. It is to be powered by the Daimler-Benz DB 601E.

1939

26 January Bf 109 V22, fitted with a DB 601A because of production delays with the DB 601E, is flight tested to trial the new supercharger intake scoop intended for the F-model.

1 April RLM (*Reichsluftfahrtministerium* – Reich Air Ministry) places an order for 15 pre-production Bf 109F-0s for delivery between November 1939 and April 1940. Delivery dates are later moved to June 1940–February 1941 after Hitler briefly curtails development work on all combat aircraft designs.

1940

June First of 921 Spitfire IIs (fitted with the Merlin XII engine) built at the Lord Nuffield shadow factory at Castle Bromwich.

June First batch of Bf 109F-0s is delivered to the Luftwaffe.

July No. 611 Sqn becomes the first frontline unit to receive the Spitfire II.

August Production of the first operational F-model, the F-1, commences at Regensburg, with 206 machines eventually being built through to February 1941.

9 October Major Werner Mölders, *Kommodore* of JG 51, gives the Bf 109F its combat debut when he flies two, uneventful, sorties across the Channel. Two days later he claims a Spitfire I of No. 66 Sqn destroyed, possibly while flying an F-model, to give the variant its first combat success. He is definitely at the controls of an F-1 when he downs two Spitfire IIAs of No. 603 Sqn over Kent on 25 October.

11 November Oberleutnant George Claus, 11-victory ace and *Staffelkapitän* of 1./JG 51, becomes the first Bf 109F pilot to be shot down when he parachutes from his fighter after it is hit by a Spitfire II of No. 603 Sqn while escorting Ju 87s attacking ships in the Thames Estuary.

20 December Fighter Command mounts first offensive operation when a pair of Spitfire IIs led by Flt Lt Pat Christie of No. 66 Sqn strafe Le Touquet airfield. This is the first time Spitfires have operated over France since the evacuation of Dunkirk six months earlier.

1941

10 January First ‘Circus’ operation flown. Aimed at drawing Luftwaffe fighters into combat, It is a modest effort comprising just six Blenheims, escorted by 12 squadrons of fighters, targeting an ammunition dump near Calais. Spitfire I/IIs of Nos. 41, 64 and 611 Sqns provide top cover while those of Nos. 66, 74 and 92 Sqns undertake rear cover and No. 610 Sqn is part of the target support force.

January	The first stop-gap Spitfire V, fitted with the improved Merlin 45 engine, commences flight trials.
February	No. 92 Sqn introduces the Spitfire V into operational service from Manston.
6 March	Chief of the Air Staff (CAS) ACM Sir Charles Portal gives the go-ahead for the Spitfire V to be put into quantity production after problems with the re-engineered and strengthened Spitfire III and its complex Merlin XX prove difficult to solve expeditiously.
March	JG 53 becomes the second *Jagdgeschwader* (after JG 51) to re-equip with the Bf 109F. JG 2, JG 3 and JG 26 would also see combat with the F-model on the Channel Front during 1941.
May	The first of 1,883 examples of the definitive Bf 109F-4 start to reach frontline units, this variant being fitted with the DB 601E engine and new MG 151/20 cannon. Most surviving F-1s, F-2s and F-3s are converted into F-4s during overhauls.
September	Focke-Wulf Fw 190 is encountered for the first time over France by Fighter Command. Nicknamed the 'Butcher Bird', it would progressively replace the Bf 109F within JG 2 and JG 26 over the next 12 months.
December	Fighter Command loses more than 500 pilots in 1941 during the Channel Front campaign, the bulk of these flying Spitfires.
December	JG 2 and JG 26 claim 838 victories (primarily Spitfires) between 22 June and 31 December. Fighter Command claims 731 victories in return, although Luftwaffe losses amount to just 110 aircraft in combat.

1942

January	No Spitfire IIs remain in operational service with Nos. 10, 11 and 12 Groups, which now have 34 Spitfire VB units between them.
March	JGs 2 and 26 ordered to create *Jabo* (*Jagdbomber* – fighter-bomber) *Staffeln* to attack British coastal shipping with bomb-equipped Bf 109F-4/Bs.
19 August	Spitfire Vs from 42 squadrons support the ill-fated Dieppe Raid, codenamed Operation *Jubilee*. The RAF flies nearly 3,000 sorties that day and 62 Spitfires are lost to all causes. JG 2 and JG 26, equipped mainly with Fw 190s, lose 23 fighters.
August	Last examples of the Bf 109F fighter replaced in frontline service with Fw 190s, although JG 2 and JG 26 continue to fly *Jabo* aircraft through to year-end.

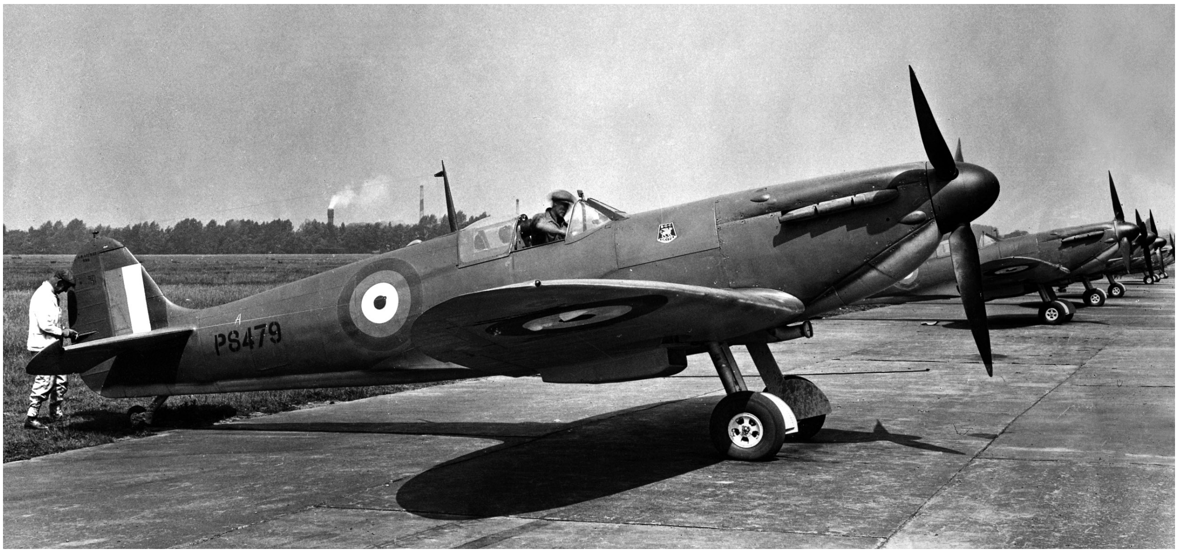
This Bf 109F-2 was part of I./JG 51 when it returned to the Channel Front in early 1941 after partially re-equipping with the first 'Friedrichs' to be issued to an operational unit. It was almost certainly photographed at Coquelles, which is today the site of the Eurotunnel complex southwest of Calais. (EN-Archive)

DESIGN AND DEVELOPMENT

SPITFIRE II AND V

Vickers Supermarine commenced Spitfire construction at its Eastleigh plant in April 1938, although only 306 examples had reached the RAF by the time Britain declared war on Germany on 3 September 1939. As early as May of the previous year it was obvious to the RAF that even with the system of sub-contracting organised by Vickers Supermarine, it was not going to receive anywhere near the number of Spitfire Is required to equip a rapidly expanding Fighter Command. A production line similar to that used by the automotive industry was urgently required and the man chosen by the Air Ministry to achieve this was Lord Nuffield, better known as William Morris. Having created the first plant to mass-produce cars for the British market, he was perfectly qualified to establish a new 'Shadow Factory' to build Spitfires.

Although the Air Ministry insisted that the factory be built in Liverpool to help ease unemployment in the area, Lord Nuffield urged that a site at Castle Bromwich be chosen due to the availability of a skilled workforce in Birmingham. Work duly began on the factory in the West Midlands in July 1938 and when finished it had cost more than £4 million to build. Nuffield estimated that the plant would assemble 60 aircraft a week once it was in full production, the Air Ministry having placed an order for 1,000 Spitfire Is in April 1939. After a series of delays, the first example was



The finishing touches are applied to Spitfire IIA P8479 as it waits on the ramp at Castle Bromwich for collection by the RAF in early July 1941. Built towards the end of the Mk II production run, this aircraft was paid for by a £5,000 donation from the directors, staff and workers of British Glues and Chemicals Ltd of Welwyn Garden, Hertfordshire. It displays the company emblem just forward of the cockpit. Allotted to No. 74 Sqn in August 1941, the fighter saw little combat. After a lengthy spell with No. 61 OTU, the Spitfire was converted into an ASR(IIC) air-sea rescue platform and supplied to No. 277 Sqn at Gravesend in January 1943. P8479 returned to No. 61 OTU in late May 1944 and was eventually damaged beyond economical repair in August of that year. (Philip Jarrett)

delivered on 27 June 1940. The machines emerging from the 'Shadow Factory' were designated Spitfire IIs to differentiate them from the near-identical Vickers Supermarine-built Mk Is when it came to ordering spare parts.

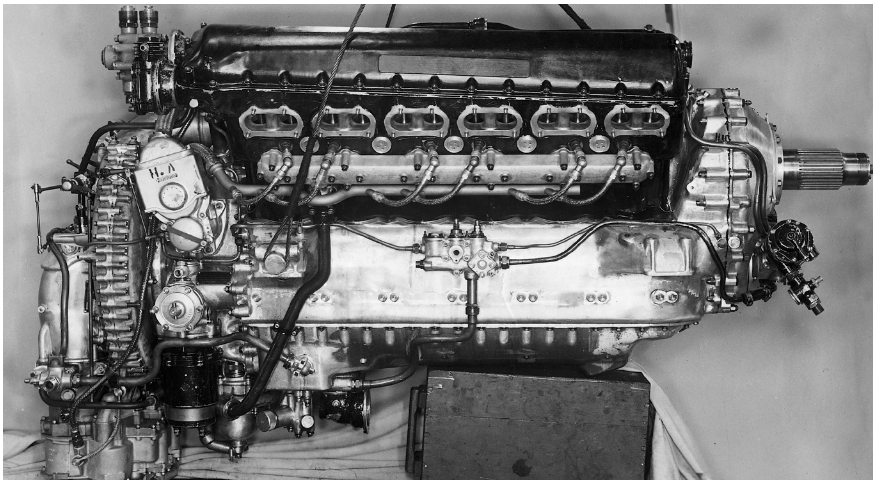
The West Bromwich-built fighters were powered by Merlin XII engines running on 100 octane fuel. They also featured a Coffman cartridge starter system instead of the original electric start of the Mk I's Merlin II, with a small fairing on the left side of the engine cowling housing the new unit.

With the Battle of Britain raging, the first Spitfire IIs to be issued to a frontline unit reached No. 611 Sqn at Digby in late August 1940. Nos. 19, 74 and 266 Sqns received the new variant the following month, while further units replaced their Mk Is during the late autumn and early winter. Squadrons assigned to No. 11 Group, defending southeast England, were given priority as the fighting was heaviest there. The Castle Bromwich factory was the sole producer of the Spitfire II and 921 had been built by the time the last example rolled off the line in July 1941.

By then the Mk II had been well and truly supplanted in the frontline by what would prove to be the most numerous Spitfire variant, the Mk V. Vickers Supermarine had originally intended to replace the Mk I/IIs with the Spitfire III which featured a re-engineered and strengthened airframe incorporating several key design improvements. Converting production lines in Southampton and West Bromwich to build the new variant would involve considerable re-tooling, however, and this would take time.

During the winter of 1940–41 the RAF was concerned that it would be forced to fight the Battle of Britain all over again the following summer, possibly against new fighter and bomber types with improved high-altitude performance that were reportedly under development in Germany. The RAF believed that the Luftwaffe's switch to high-altitude operations by small numbers of fighters (including the first examples of the Bf 109F) and bombers in November 1940 was the precursor of a renewed offensive in the spring of 1941. The Hurricane could not intercept the Bf 109F above 20,000ft, let alone fight it, while the Spitfire I/IIs lost much of their advantage over the earlier Bf 109E in terms of manoeuvrability and speed when forced

A great deal of the Rolls-Royce Merlin's success during World War 2 came from the exceptional design of its supercharger, seen at the left-hand end of the engine in this photograph. While the German DB 601 engine had a capacity of 33.93 litres, the Merlin's was a mere 26 litres, and would remain this size for the entire war. The ability of Rolls-Royce to progressively improve the power of the Merlin through supercharger design and higher-octane fuel took the engine's rating from 1,000hp at the start of the war to 2,300hp in 1945. The Merlin 45, seen here, is equipped with a single-stage, single-speed supercharger. The Spitfire V and Seafire IB, IIC and III would be powered by the Merlin 45, 45M, 46, 50, 50A, 50M, 55 and 55M series of engines. (Donald Nijboer)



to fight at such altitudes. Although fears of high-altitude combat would ultimately prove to be unfounded, they had a significant impact on the Spitfire's development.

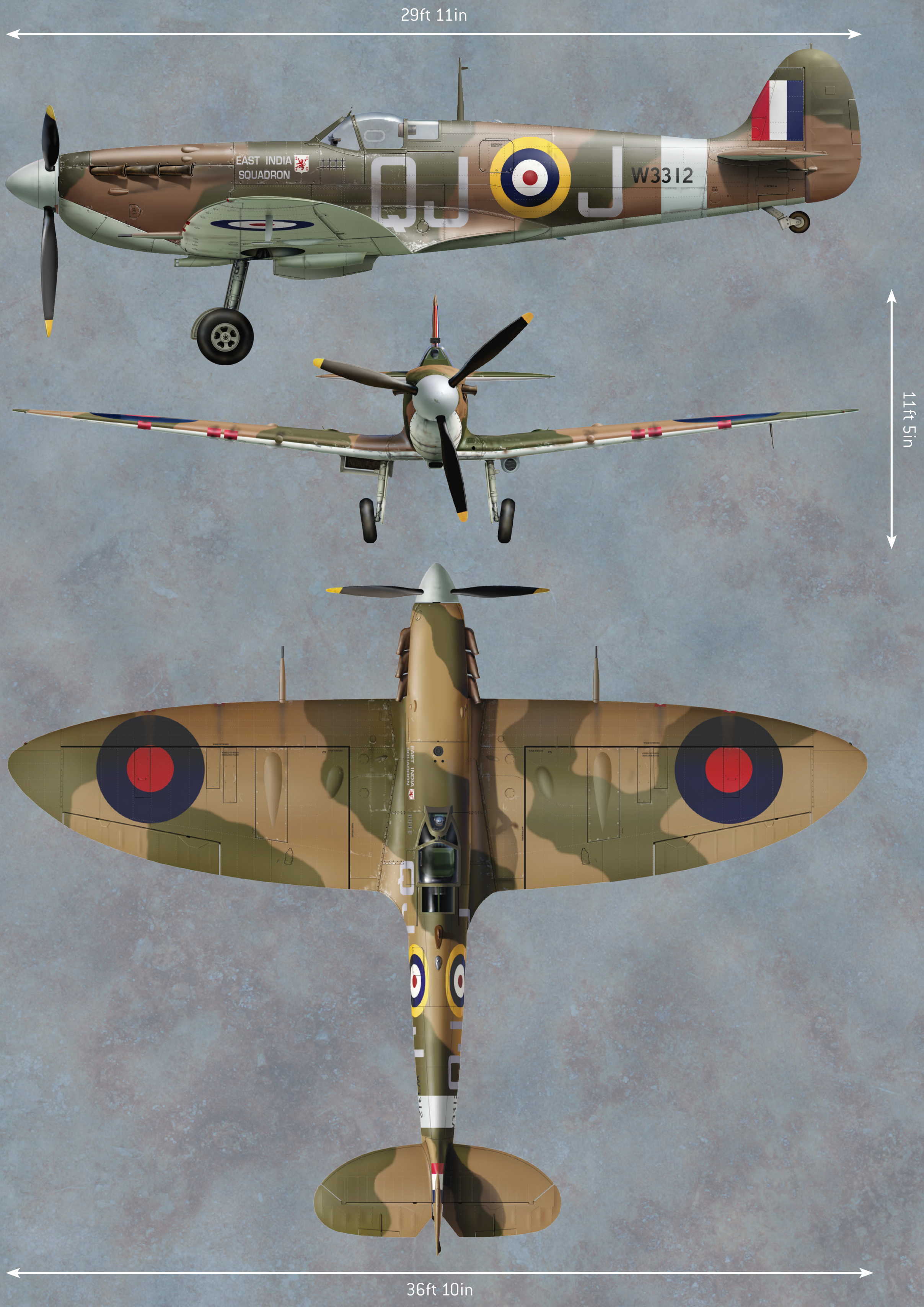
The Mks I and II would be unable to engage enemy aircraft at altitudes exceeding 36,000ft and the RAF demanded a re-engined version capable of enhanced performance. The newly developed Rolls-Royce Merlin XX was intended to provide the Spitfire III with the ability to operate at high altitude. But the engine, which featured a redesigned supercharger with two separate blowers for high- and low-altitude operations, proved to be so complex that Rolls-Royce stated it would be difficult to build in the quantities required by the RAF by the early spring of 1941. Furthermore, Vickers Supermarine made it clear that if these engines were not available it could not guarantee the supply of Spitfire IIIs to the tight production schedule demanded by the RAF.

Fortunately, Rolls-Royce had also been working on a simplified version of the Merlin XX with the low-altitude blower omitted. Known as the Merlin 45, it developed 1,515hp at 11,000ft with +16lb of boost. This represented an increase of 500hp over the Merlin III fitted to the Spitfire II, despite being no larger and only moderately heavier. The engine also lifted the fighter's service ceiling close to 40,000ft, compared with the Mk II's 34,000ft. Lacking the second blower, the engine was also much easier to mass-produce than the Merlin XX, and thanks to its physical similarity to the Merlin III, the Merlin 45 could be fitted to Spitfire I/II airframes with minimal modification. The new fighter, which was then seen by the RAF as a stop-gap pending resolution of the Mk III's problems, was designated the Spitfire V.

On Christmas Eve 1940 a meeting was held at the Aeroplane and Armament Experimental Establishment at Boscombe Down during which Royal Aircraft Establishment staff joined engineers from Vickers Supermarine and Rolls-Royce and senior pilots from Fighter Command to find a solution to the high-altitude performance problems afflicting the Spitfire. Rolls-Royce admitted that large quantities of Merlin XXs would not be available for many months. But it believed it could quickly modify the production Merlin III to Merlin 45 specification and deliver at least 300 by 1 March, with 200 more to follow by 1 April. Just days after the meeting the Air Ministry contracted Rolls-Royce to convert 500 Merlin IIIs into Merlin 45s.

OPPOSITE
Spitfire VB W3312/QJ-J *Moonraker* was delivered new to No. 92 Sqn on 20 June 1941 and it was immediately 'acquired' by the unit's boss, Sqn Ldr 'Jamie' Rankin. He duly claimed 11 and one shared victories, one probable and four damaged (all Bf 109Fs, except for a solitary Fw 190 victory) between mid-June and late October 1941 – his first two victories in W3312 came within 24 hours of the aircraft's arrival at Biggin Hill. Rankin continued to fly this Spitfire after he had been made wing leader of the Biggin Hill Wing in September 1941. He was succeeded three months later, after which W3312 was moved on to recently arrived No. 124 Sqn. Lightly damaged on operations in April 1942, the fighter was passed to No. 65 Sqn the following month after being repaired. W3312 was eventually written off on 3 September 1942 when the aircraft suffered engine failure west of Deal during a fighter sweep. Its pilot, Plt Off N. R. Macqueen, bailed out too low over the Goodwin Sands and was killed.

Spitfire VB


29ft 11in
EAST INDIA
SQUADRON
QJ
J
W3312
11ft 5in
36ft 10in

No. 92 Sqn flight commander Flt Lt Brian Kingcome and his wingman, Flg Off Geoffrey Wellum, who was known as 'Boy' throughout the unit. Wellum rated Kingcome, who was an ace, as 'the best leader I ever flew with'. Both men flew some of the very first Spitfire VBs to reach the frontline from February 1941, and engaged Bf 109Fs during the spring and summer of that year. (John Dibbs)

Several Spitfire Is were quickly modified by Rolls-Royce to accept the new engine and flight trials commenced at Boscombe Down in early January 1941. Most of the aircraft initially converted were cannon-armed Mk IBs, although a few all-machine gun-armed Spitfire IAs were also re-engined. Flight trials soon revealed that the Mk V offered most of the performance advantages of the Spitfire III but without the production delays predicted for that variant. The Chief of Air Staff, ACM Sir Charles Portal, confirmed the abandonment of the Spitfire III in favour of the Mk V during a planning conference on 6 March. The minutes of the meeting stated:

> CAS has decided that the Spitfire V with the Merlin 45 engine with a single-speed blower shall be put into production instead of the Spitfire III. The Spitfire V with improved Merlin 45 [with a slightly larger blower impeller – i.e. the Merlin 46] will give better performance in altitude and ceiling. This will meet the needs of Fighter Command for high-altitude fighters. If the type is a success the Air Staff will want as many as can be produced.

Spitfire IB-equipped No. 92 Sqn at Manston was chosen as the unit to give the Mk V its combat debut. The first converted aircraft arrived at the Kent airfield in mid-February 1941. Over subsequent weeks the squadron sent its remaining Mk IBs to the Rolls-Royce plant at Hucknall for conversion to Mk VB standard. It took up to ten days to replace a Merlin III with a Merlin 45, which meant that for several weeks No. 92 Sqn flew both marks operationally. The first Mk Vs were almost identical to late-production Mk I/IIs, although this soon changed when No. 92 Sqn discovered that the Merlin 45 ran at excessively high oil temperatures and low pressures when at high altitude. Clearly, the fighter's unmodified oil cooling system was not powerful enough to cope with the increased demands placed upon it by the blown Merlin 45. A larger matrix had to be fitted to the cooler, and this in turn meant a larger intake to allow increased airflow through it. The oil cooler intake under the left wing was enlarged and made circular, rather than semi-circular as on the Spitfire I/II – this was an obvious identification feature for the new variant.

Among the No. 92 Sqn pilots giving the Spitfire VB its operational debut was Flg Off Geoffrey Wellum, who recalled one of his early flights with the aircraft in his outstanding autobiography *First Light*:

> Increase in all-round performance is truly tremendous and perhaps most important of all it gives us a much higher ceiling. Only the other day I was a member of the squadron patrolling North Foreland to Dungeness and our entire formation was flying at just a fraction under 40,000 ft. The view was breath-taking. A clear, cold day and I gazed in wonderment at the coastline as it swept right round the bulge of East Anglia to where it curves away westward into the Wash. To the west, the Isle of Wight stood out so plainly that I felt I could put my hand out and almost touch it. Way beyond was Portland Bill. It was a great experience and the sheer beauty had a great and lasting effect on me.

But Wellum's flight was curtailed when he noticed that his oil temperature had climbed alarmingly. This was to be the curse of the early Mk VBs. Five of his squadronmates suffered similar problems during these early sorties, which otherwise proved the Merlin 45's enhanced performance. Wellum recalled, 'The height and results we achieve astound even the boffins, something about the cold winter air giving greater volumetric efficiency.' Yet despite the dramatic results of these flights, No. 92 Sqn received a shock when two German aircraft were spotted *above* them during a patrol:

> We were all shattered when a pair of 109s described a couple of wide circles round our formation about 1,000ft above us. We were at the absolute limit of our ceiling and could do sweet damn all about it. I bet they in turn were surprised to see a whole squadron of Spits patrolling in good order at only just below their height. They made no attempt to attack and the thought was that they might have been unarmed photo recce aircraft.

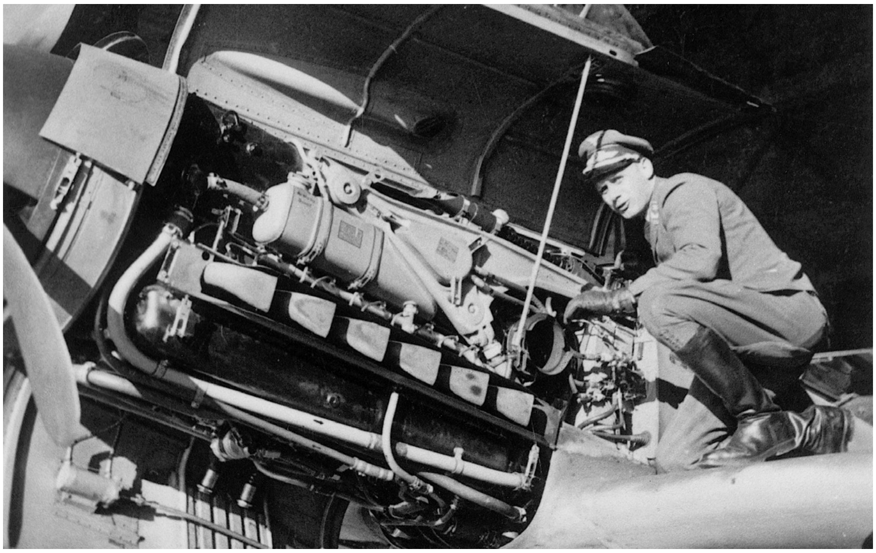
No. 92 Sqn also encountered problems with the Spitfire VB's de Havilland Hydromatic propellers, or, more specifically, failure of the constant speed unit (CSU) that controlled them. This came to a head on 19 March 1941 when three pilots, including the CO, Sqn Ldr James Rankin, were forced to crash-land due to CSU failure during a fruitless high-altitude search for Bf 109s detected at 36,000ft over Kent. Normally, the CSU limited the maximum speed of the Merlin engine to about 3,000 rpm, but at the very low temperatures encountered by the No. 92 Sqn fighters the oil in the CSUs congealed and the propeller blades went to full pitch. The engines duly raced to 4,000 rpm and threatened to shake themselves apart, forcing the pilots to shut down immediately. All three escaped the ensuing forced landings without injury, although their precious Mk VBs were sufficiently damaged to keep them out of action for several months. Following this incident pilots flying the Spitfire V at extreme altitude were instructed to make frequent throttle changes to exercise the propeller pitch mechanism. At the same time, as many Mk Vs as possible were fitted with Rotol CSUs until a modification was devised to solve the problem with the de Havilland propeller.

Issues with the Mk VB's 20mm cannon armament and the ballooning of fabric-covered ailerons at speeds in excess of 400mph also afflicted the aircraft in its early service career. Both these problems were inherited from the earlier Spitfire I/II but were eventually solved as the Spitfire V rapidly matured – this variant was the subject of more than 1,100 modifications during its service life. Far from being a stop-gap, the Mk V proved to be the workhorse of Fighter Command during the Channel Front campaign. A total of 6,479 examples were built between January 1941 and November 1943.

Bf 109F

Augsburg-based Bayerische Flugzeugwerke began work on what would become the Bf 109F in the autumn of 1938 just as the first Daimler-Benz-engined version of the Messerschmitt fighter, the Bf 109E, was about to enter frontline service with the

The DB 601N of this early-build Bf 109F-1 is exposed for routine maintenance. The upper cowling of the F-model was not only aerodynamically cleaner than the 'Emil's', but it was designed in a much more practical way. Whereas the E-model's was in one piece, the 'Friedrich's' upper cowling was split in two halves fastened by two clips on each side. This meant that both cowling sides could be rotated upwards around a common axis, separately or together. As can be seen here, this gave the mechanics improved access to the engine. (EN-Archive)



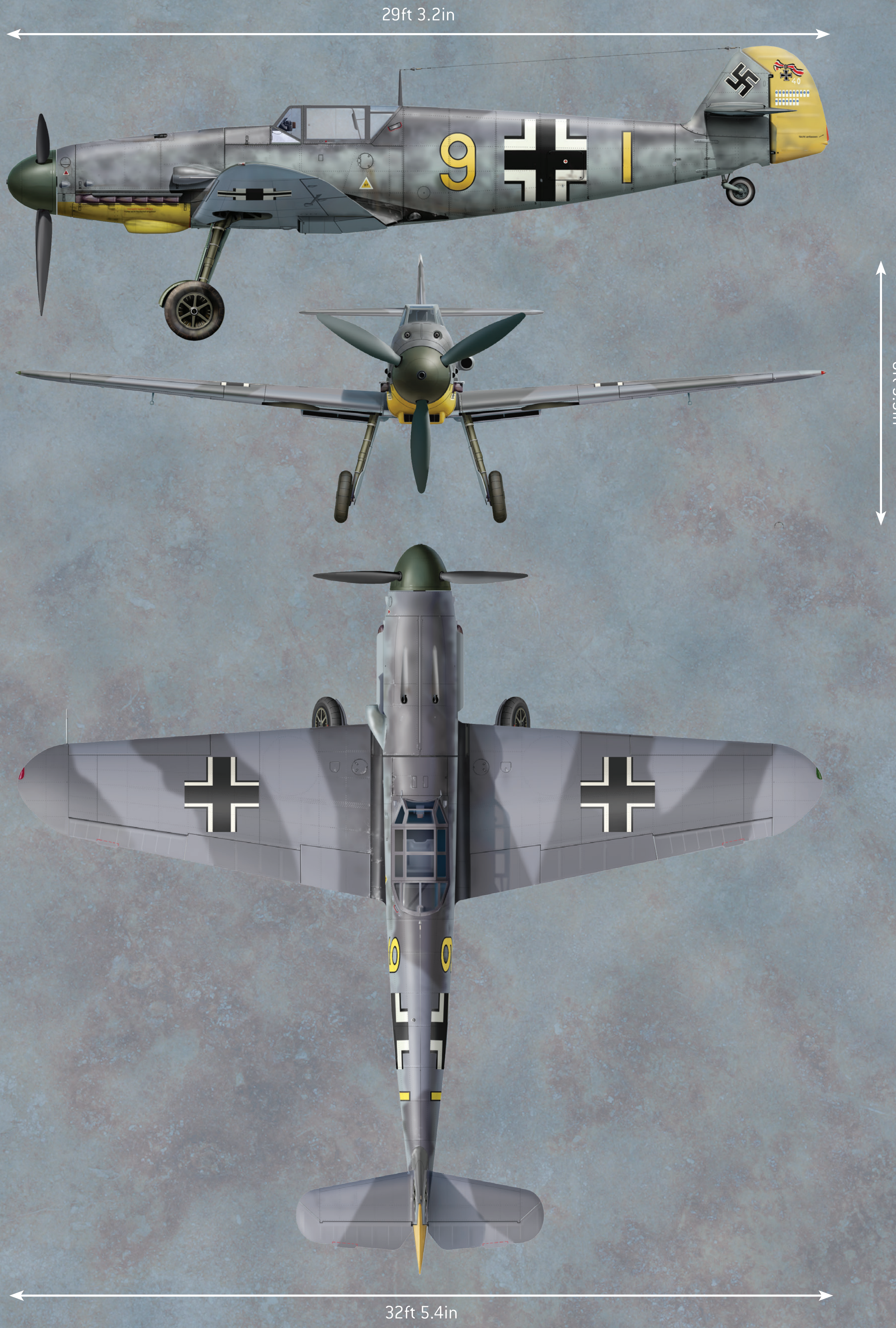
Luftwaffe. Company founder Professor Willy Messerschmitt and Chief of Project Planning Robert Lusser wanted an aircraft that could exceed the performance of previous Bf 109 variants through a combination of airframe aerodynamic refinements and the installation of a more powerful version of Daimler-Benz's DB 601A engine. The latter, designated the DB 601E, utilised direct fuel injection to its inverted V12 cylinders – as had the DB 601A – to give the powerplant a predicted 1,350hp at 17,750ft. This represented an increase of 23 per cent over the DB 601A. The new engine was 17.2 inches longer, which dictated a major redesign of the Bf 109's engine bearers and cowling. The F-model would also feature the streamlined propeller spinner created for the next generation of Messerschmitt single- and twin-engined fighters and inspired by the record-breaking Me 209 racing aircraft.

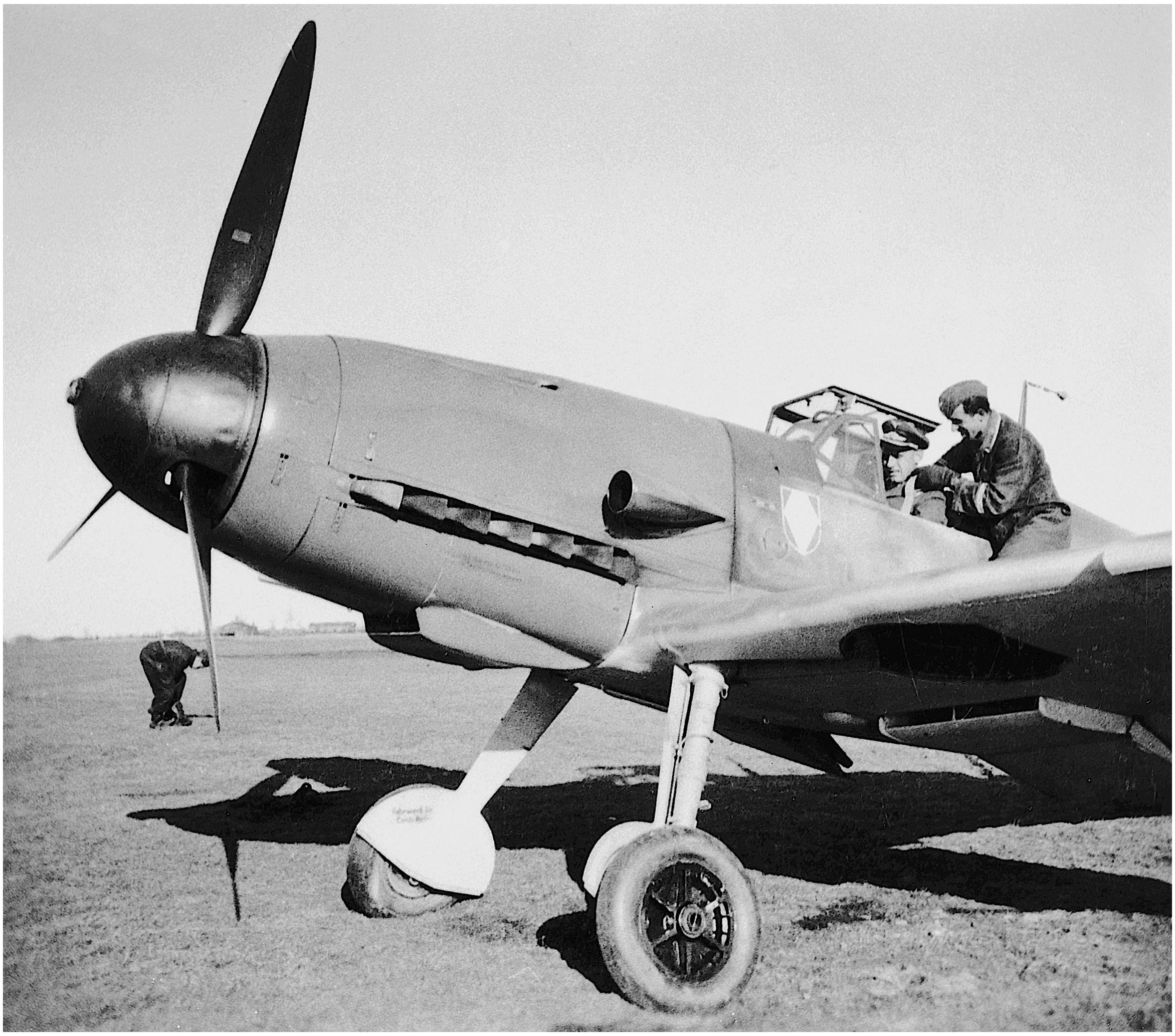
In a bid to achieve the most streamlined forward fuselage possible, Messerschmitt redesigned the chin-mounted oil cooler intake which was such a recognition feature of the E-model. It also revised the wing-mounted coolant radiators by making them twice as wide and half as deep as those fitted to the Bf 109E. This new design drastically reduced drag. Two-piece airflow flaps were located at the rear of the radiator housings, replacing the single-piece flap of the 'Emil'. The bottom flap both adjusted the airflow and acted as the landing flap. The wings also featured extended semi-elliptical tips rather than the distinctive clipped tips of the Bf 109E. There were also re-shaped ailerons, leading edge slats and flaps. To save weight, no wing armament was installed, the F-model featuring a single engine-mounted 15mm or 20mm cannon firing through the propeller hub, supplemented by two MG 17 7.92mm machine guns mounted in the upper cowling.

The tail area of the Bf 109F was also cleaned up to improve the aerodynamics. The most significant of these changes was the removal of the tailplane bracing struts. Although this greatly reduced drag, it also weakened the airframe to the point where several early aircraft were lost in combat when their tail units broke off due to high-speed flutter. The weak point was the tail unit attachment ahead of the tailplanes leading edges and the tailwheel recess. This problem was cured in early examples by

OPPOSITE
Bf 109F-2 Wk-Nr 9552 was assigned to 9./JG 2's *Staffelkapitän*, Oberleutnant Siegfried Schnell, the leading ace on the Channel Front in terms of Spitfire II/Vs destroyed. Maintained in immaculate condition at the *Gruppe*'s Theville base in the spring of 1942, the aircraft was finished in standard camouflage for the period, with the addition of protective paint on the wing roots and lower fuselage to prevent staining by exhaust deposits. A total of 57 victories were displayed on the rudder.

Bf 109F-2


29ft 3.2in
8ft 5.3in
32ft 5.4in



A pilot is helped on with his straps as he settles into the cockpit of a brand new Bf 109F-2 in early 1941. This is a machine from I./JG 51, and it was among the first 'Friedrichs' to reach the Channel Front in February 1941. Note the fighter's streamlined forward fuselage, Messerschmitt having redesigned the previously protruding chin oil cooler intake that was such a recognition feature of the Bf 109E. Final details of the I./JG 51 'Gemsbock' unit badge had still to be added to the partially applied marking below the cockpit when this photograph was taken. (EN-Archive)

two thin metal strips riveted to the weak point. Definitive modifications were included as part of the production process at Messerschmitt.

The F-model also featured numerous internal improvements. These included a redesigned cooling system with coolant tanks positioned on either side of the engine; a semi-rigid self-sealing fuel tank (on later models only); improved armour to protect the fuel tank and pilot; a new hydraulic system with a reservoir located on the left-hand side of the engine; improved cockpit instrumentation; and electro-mechanical variable pitch control for the VDM 9-11207A or 9-12010A three-bladed metal propeller, the latter modification having been introduced in late-production E-models.

Assembly of two experimental prototypes began in the early winter of 1938 once initial research had been completed. The first of these, designated Bf 109 V22, made its maiden flight on 26 January 1939. It was already clear that series production of the DB 601E was behind schedule and the V22 had to be fitted with a DB 601A instead. A second prototype (the V23) flew soon afterwards, fitted with the still experimental DB 601E motor. Both of these aircraft were, in fact, re-engined Bf 109Ds, and during the spring and summer of 1939 they were used for testing the engine, forward fuselage profile, new cooling system and modified wings.

Although the RLM had placed an order for 15 pre-production Bf 109F-0s for delivery between November 1939 and April 1940, progress with the F-model was slow. This was due to ongoing issues with the DB 601E, while Messerschmitt was forced to focus on production of the Bf 109E because of the outbreak of war. It was decided that early aircraft would have to be fitted with the less powerful DB 601N, although it would only be available in modest numbers from mid-1940 due to the Luftwaffe's high demand for the proven DB 601A. Nevertheless, three Bf 109F-0s were assembled during January 1940, these aircraft being regarded as prototypes for the production model. Work was then abruptly halted by order of the Führer himself, as he believed that he could conquer western Europe with the weapons already at his disposal. By then at least two factories had already made preparations for series production of the Bf 109F.

At the end of May 1940 it was decided to restart the 'Friedrich' programme, with a fourth F-0 assembled in late June. By February 1941 14 had been completed, with the final five being built by June of that year. No two F-0s were alike, as Messerschmitt used them to test new systems and equipment in an effort to improve the fighter's performance. Early examples lacked the modified wings with elliptical tips, while others featured differing supercharger air intake shapes – no fewer than ten shapes were tested. All aircraft were initially powered by DB 601A/Ns, although several F-0s and early F-1s were fitted with the definitive DB 601E for flight testing from March 1941. One F-0 served as the series production prototype for the F-1, being fitted with a DB 601N, while another was used as a test bed for the wing slats and radiator flaps unique to the F-model. Finally, another F-0, fitted with standard E-model wings, tested the 'Friedrich's' engine cooling system.

Despite flight trials with the ever-increasing fleet of Bf 109F-0s still far from completion at Rechlin and elsewhere, the RLM ordered Messerschmitt to start series production of the F-1 at its Regensburg factory from August 1940. The following month the first examples of the Mauser MG 151/15 cannon were delivered to Regensburg for installation in the F-2 variant. Production of this model started shortly thereafter. Assembly of this model commenced at AGO in November, while at the same time F-1 production started at the WNF plant. By spring 1941 the Messerschmitt factories at Regensburg and Augsburg had assembled 157 aircraft – 19 F-0s and 138 F-1s – and the WNF plant 49 F-1s. These numbers fell well short of the 610 planned by the RLM, which meant that the F-model played only a minor role in operations on the Channel Front in the first six months of 1941, with just a single *Jagdgeschwader* (JG 51) fully re-equipping with the fighter.

In January and February 1941 construction of the F-2 commenced at two more plants (including WNF), and the variant would remain in production until September of that year. By then the definitive Bf 109F-4, which at last featured the DB 601E engine and incorporated many of the improvements demanded by the Luftwaffe after early combat with the F-1/2, had been rolling off the assembly lines for four months. F-4s would continue to be built until the summer of 1942, by which time 2,550 'Friedrichs' of all sub-variants had been completed and the fighter's combat career, on the Channel Front at least, was rapidly coming to an end.

TECHNICAL SPECIFICATIONS

SPITFIRE

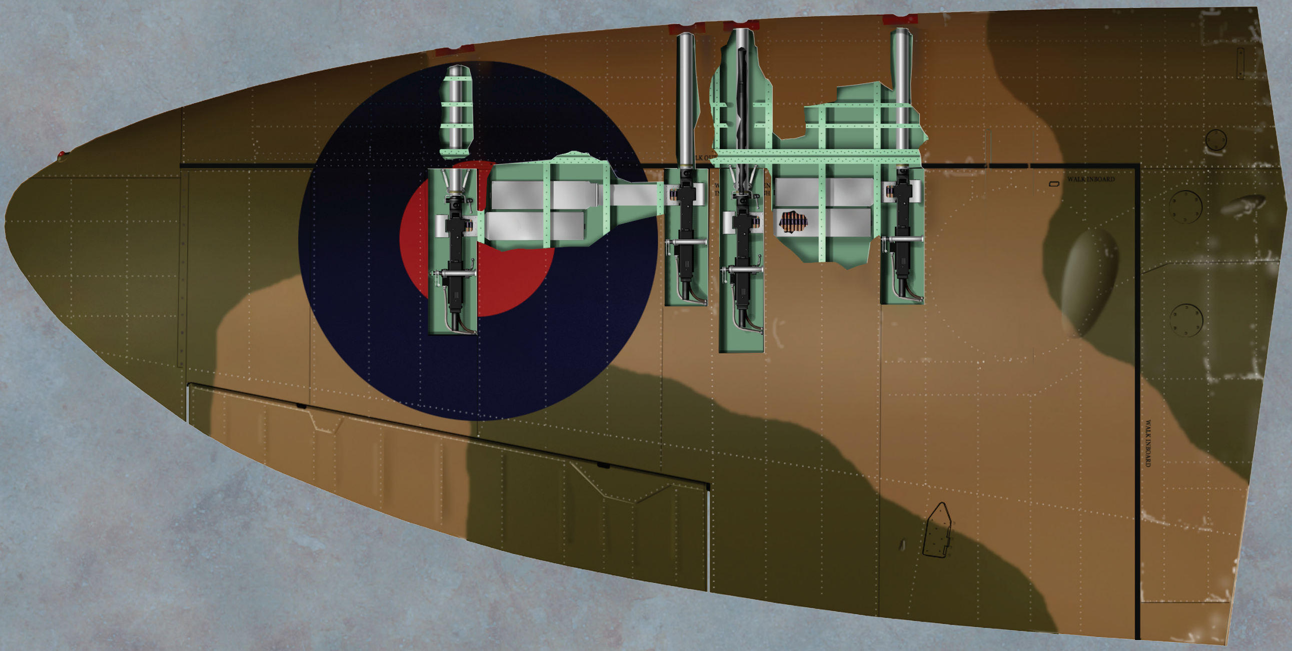
SPITFIRE IIA/B

Following a series of delays, the massive 'Shadow Factory' established by Lord Nuffield in Castle Bromwich at last began to produce Spitfires in June 1940. These aircraft were virtually identical to late-production Spitfire Is built elsewhere in the UK but they were fitted with the Merlin XII engine, which produced 110hp more than the

A No. 54 Sqn Spitfire IIA is serviced by a team of riggers and fitters at Hornchurch between operations during the early summer of 1941. Having spent five months at Catterick (No. 13 Group) from early September 1940 after being all but wiped out during the early stages of the Battle of Britain, No. 54 Sqn returned south to No. 11 Group in February 1941. Issued with Spitfire IIAs in place of its war-weary Mk Is upon arrival at Hornchurch (its spiritual home from 1930), the unit eventually replaced these aircraft with a mix of Mk VAs and VBs shortly after this atmospheric photograph was taken. The pilots in the foreground appear to be discussing their recent mission, while the squadron 'spy' (intelligence officer), his hands on his hips, listens intently. (Andrew Thomas)

SPITFIRE IIA/VA WING GUNS

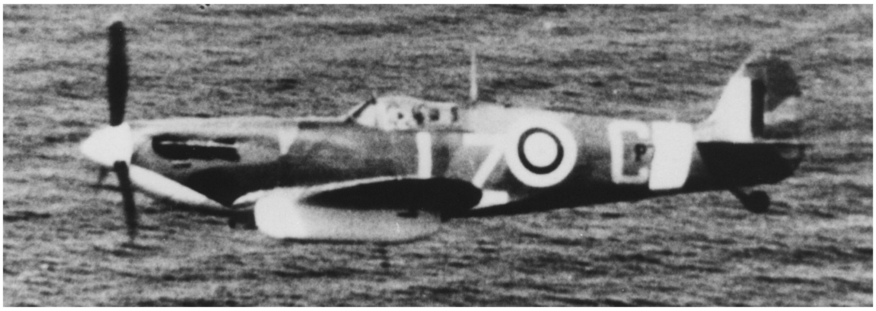
The Spitfire IIA and VA was armed with four Browning 0.303-in. machine guns in each wing. This weapons fit was designated the A-type wing with the advent of cannon-armed Spitfire IBs. Rate of fire was 20 rounds per second per gun (160 rounds per second overall) and each cartridge fired ball, armour-piercing, tracer or incendiary bullets weighing around 11.3 grams at a velocity of 2,430ft per second. Total weight of projectiles fired was 4lb per second. Ammunition capacity (350 rounds per gun) was enough for 16 seconds of continuous firing in the Spitfire. Although the Brownings were reliable, they were regularly criticised by RAF pilots for not providing them with sufficient punch when it came to shooting down enemy aircraft.



Merlin III. Designated the Spitfire IIA, the first examples were delivered to No. 611 Sqn in August 1940, followed by Nos. 19, 74 and 266 Sqns. Towards the end of the aircraft's production run, 170 20mm cannon-armed Spitfire IIBs were constructed at the Castle Bromwich factory, these aircraft also boasting four 0.303-in. machine guns. By the time Spitfire IIA production ended in July 1941, 751 examples had been built.

SPITFIRE IIA LONG RANGE

Operations over Dunkirk in May–June 1940 had revealed the Spitfire's limited radius of action, so Vickers Supermarine looked to extend its fighter's range with an external fuel tank. Spitfire I P9565 first flew with a 30-gal tank beneath its port wing in the summer of 1940, but the outbreak of the Battle of Britain stymied development until Fighter Command commenced offensive operations over Europe in early 1941. Eventually, 60 Spitfire IIA Long Range (LR) fighters were built with a 40-gal fixed tank under the port wing, these lop-sided aircraft initially seeing service in the spring of 1941. Although less manoeuvrable and 26mph slower than a standard Spitfire IIA, these fighters carried nearly half as much fuel again, making them ideally suited to bomber escort missions. The Spitfire IIA (LR) was not popular with frontline pilots, one of whom was Sgt Walter 'Johnnie' Johnston of No. 152 Sqn. He recalled, in Peter Caygill's book *Spitfire Mark V in Action*:



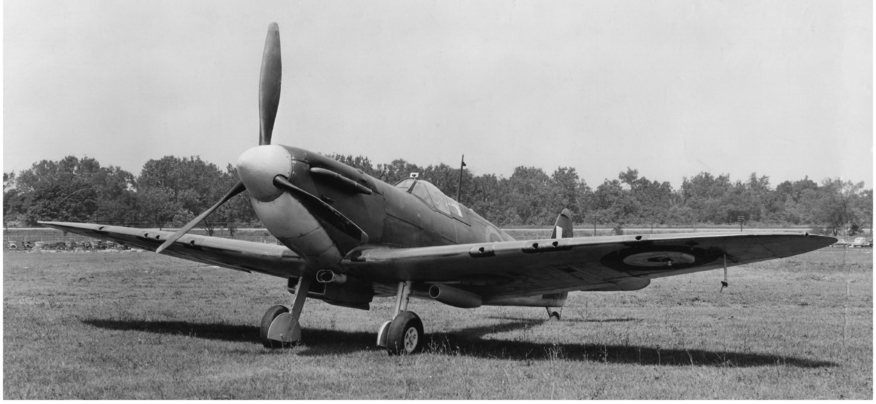
This Spitfire II (LR) was one of 60 aircraft built with a 40-gal fixed fuel tank fitted under the port wing and used by Fighter Command for long-range bomber escort missions from the spring of 1941 through to year-end. Because of their paucity in numbers, the aircraft were routinely swapped between units operating in Nos. 10 and 11 Groups. This particular Spitfire II (LR) is marked up with No. 66 Sqn's 'LZ' codes. (Dr Alfred Price)

> When we got the awful long-range Spitfires we all had very narrow escapes. Taking off was full right rudder and stick almost hard over in the same direction. This was due to the extra weight on the port wing only. Flying circuits and bumps to get the feel was dicey as it meant takeoffs and landings with a full wing tank. There was no such thing as a typical curving Spitfire approach to keep the ground in sight – not with about 150–300lb on the inner wing. So we trundled in as if the runway was that of a carrier. Some of us did forget and had hair-raising things happen. We lost two pilots who just undercooked the turn and slipped in.

Overload tanks for the Spitfire V did not appear on the Channel Front until the summer of 1942 (by which time the Bf 109F had all but disappeared from frontline service in this theatre). These tanks were more streamlined and mounted on the aircraft's centre section between the undercarriage legs, thereby eradicating the handling problems associated with the Spitfire IIA (LR). Crucially, the tanks could be jettisoned. Suitably modified Spitfire Vs were initially issued to Nos. 66 and 152 Sqns to replace the last of the Mk IIA (LR)s still in frontline service.

SPITFIRE V

The Spitfire V was simply a Mk I/II airframe fitted with the new Merlin 45, 46, 50 or 50A engine. The Merlin 45 was the less complex version of the Merlin XX, designed to power the Mk III. The supercharger's second stage (for improved low-altitude performance) was removed and replaced with a new single-speed single-stage supercharger. The Merlin 45 was rated at 1,440hp on takeoff and was easy to mass



The Spitfire VA was virtually indistinguishable from the Mk I and II. Equipped with the A-type wing, it featured the same exhaust stubs, canopy and de Havilland propeller as fitted to the early marks. In fact, the only way to distinguish a Mk VA from a Spitfire I or II was by the larger oil cooler fitted to the later mark, with its deeper housing and circular air intake, located under the port wing. This aircraft is R7347, which was one of two early-build Mk VAs sent to Wright Field in Dayton, Ohio, in May 1941 for evaluation by the US Army Air Corps. (Donald Nijboer)

In July 1941, following completion of the final Spitfire II, the huge production facility at Castle Bromwich began turning out Mk Vs in large numbers. The aircraft in the middle of this production line photograph is BL923, which was issued to No. 310 Sqn in March 1942. Damaged in a flying accident in June of that year, the fighter was passed on to No. 453 Sqn in early October and lost on the last day of that month when it suffered engine failure and crashed into the Channel during a convoy patrol. Its pilot, Australian Sgt J. R. Furlong, was killed. (Dr Alfred Price)

produce. Other engine improvements included a new carburettor that allowed for negative G manoeuvres and prevented interruption of fuel flow to the engine. Pilots soon found the Merlin 45-powered Spitfire V ran at excessively high oil temperatures. The original Spitfire I/II engine cooling system was not powerful enough, so a larger matrix had to be fitted to the cooler. This, in turn, required a larger air intake. The new oil cooler intake was enlarged and made circular in shape. The Spitfire I/II's fabric-covered ailerons were also replaced with examples made from light alloy.

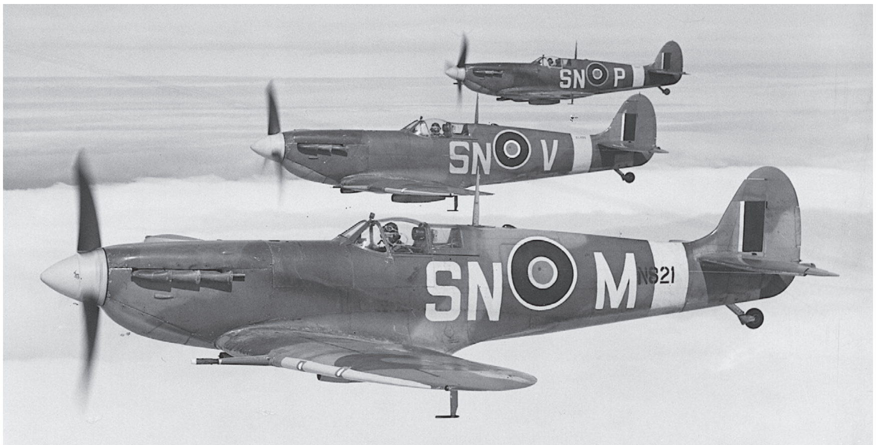
The first Spitfire Vs built were fitted with the A-type wing that housed eight 0.303-in. Browning machine guns. Armour plating was also increased and now weighed 129lb. Top speed for the Spitfire VA was 375mph at 20,800ft. Just 94 were built.

The Spitfire VB would ultimately be the most numerous Mk V variant. It featured the B-type wing, housing two Hispano 20mm cannon, with 60 rounds per weapon, and four 0.303-in. Browning machine guns with 350 rounds per gun. Armour was increased in weight to 152lb. A total of 3,911 Spitfire VBs would be built, 776 by Vickers Supermarine, 2,995 in Castle Bromwich and 140 by Westland.

The Spitfire VC introduced the 'universal' C-type wing first tested on the Spitfire III prototype. The 'universal wing' was designed to reduce manufacturing time and allowed for three different armament options. The 'C' wing featured either eight 0.303-in. machine guns, two 20mm cannon and four 0.303-in. machine guns or four 20mm cannon. The Hispano Mk II cannon were now belt fed from box magazines, doubling the ammunition per weapon to 120 rounds. Early-build Spitfire VCs were delivered with four 20mm cannon but two of these weapons were usually removed once the fighter was in frontline service. Later, production would shift back to the B-type wing with two 20mm cannon and four 0.303-in. machine guns.

The Spitfire VC's airframe was also re-stressed and strengthened. The new laminated windscreen design seen on the Mk III was introduced, as were metal ailerons and a stiffened undercarriage with wheels moved two inches forward. Armour was increased to 193lb.

To increase the Spitfire VC's ferry range, a 29-gal fuel tank was installed behind the pilot. This, combined with a 90-gal slipper tank (rarely seen on the Channel Front), meant that the Mk VC could carry up to 204 gallons of fuel. This gave it a ferry range of approximately 700 miles. When fitted with four 20mm cannon, the Spitfire VC



Three Spitfire VBs from newly reformed No. 243 Sqn form up for the Air Ministry photographer during a training flight from Ouston, near Newcastle, in the summer of 1942. These fighters were typical of the Spitfire VBs rolling off the Vickers Supermarine, Castle Bromwich and Westland production lines between 1941 and 1943. EN821 in the foreground was issued new to No. 243 Sqn in late June 1942 and subsequently served with No. 65 Sqn from late October until it was badly damaged in an accident in December of that year. Once repaired and modified, the fighter was passed on to the Fleet Air Arm as a trainer for its Seafire pilots in February 1944. (Philip Jarrett)

had a top speed of 374mph at 19,000ft. Although some Mk VCs saw combat on the Channel Front, most served in overseas theatres including the Middle East, Burma and Australia. Some 2,647 Spitfire VCs would be built, 478 by Vickers Supermarine, 1,494 in Castle Bromwich and 495 by Westland.

To improve the Spitfire V's low-level performance, a number of Mk VB airframes were modified and fitted with either the Merlin 45M, 50M or 55M powerplant. The 'M' suffix denoted a Merlin engine equipped with the cropped supercharger blower that worked best at lower altitudes. Indeed, the motor delivered its optimum performance at 6,000ft. The airframe was also modified, with the Spitfire's famous pointed wingtips removed to reduce wingspan to 32ft 6in. The new square-tipped wings gave the LF (Low Altitude Fighter) V a greater diving speed, better acceleration and faster rate-of-roll compared with the standard Spitfire V. Many LF Vs used Mk VB airframes taken from storage and duly modified. Due to their previous service, these LF Vs were soon nicknamed 'the clipped, cropped and clapped Spittys' when they reached Channel Front units from early 1943. At low altitude the LF V had a maximum speed of 338.5mph at 2,000ft and 355.5mph at 5,900ft.

The Mk V variant would be built in greater numbers than any other. It would be powered by nine different types of Merlin 45 engine and would see action on every front. The Mk V would also be navalised and transformed into the Seafire IB, IIC and III. The carrier-borne version of the Spitfire took the fight to the enemy over the Atlantic, Mediterranean, Indian and Pacific oceans.

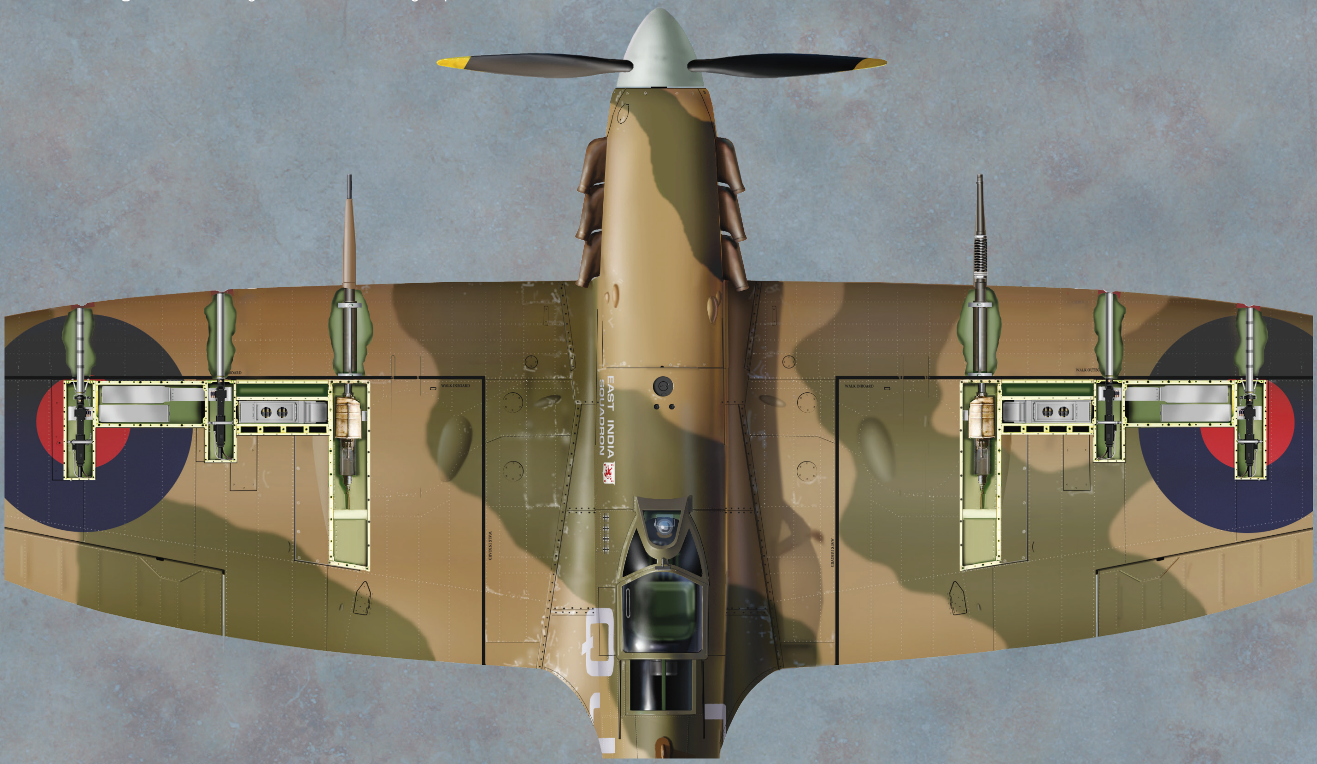
Bf 109F

Bf 109F-0

As previously noted, the 19 pre-production F-0s ordered by the RLM on 1 April 1939 served as test and development airframes for the 'Friedrich'. Delivered between January 1940 and June 1941, the F-0s made many flights from Rechlin and elsewhere as Messerschmitt and the Luftwaffe trialled airframe changes, engine upgrades, revised armament and new systems. No two airframes were the same and each example took

SPITFIRE VB WING GUNS

The Spitfire VB, which was fitted with B-type wings, boasted a powerful armament of four Browning 0.303-in. machine guns and two Hispano Mk II 20mm cannon. The latter (with just 60 rounds per gun) had a useful range of 600 yards, with a total firing time of between 10 and 12 seconds. The machine guns had ammunition for a further five seconds of firing. Plt Off Geoffrey Wellum was suitably impressed with the Mk VB's punch when he flew early examples with No. 92 Sqn in the spring of 1941, noting in his diary at the time, 'The cannons, being new to us, are exciting. The first time I fired them on an air test I was amazed at the noise and the recoil and at the damage the shells did to the ground targets.'



considerably longer to build than standard production F-models due to their unique configurations. Powered by the DB 601A, N and E, it would appear that none of the F-0s saw operational service.

Bf 109F-1

Constructed between August 1940 and March 1941, the F-1 was built by both Messerschmitt (138 examples, from Regensburg and Augsburg) and WNF (49) before production switched to the F-2. Powered by the DB 601N engine rated at 1,175hp, the fighter's armament comprised a single 20mm MG FF/M cannon firing through the propeller hub and two upper cowling MG 17 7.92mm machine guns. A handful of early examples began to reach JG 51 in northern France in early October 1940 and it was not long before development problems arose. The landing flaps proved prone to damage when lowered at speeds in excess of 250km/h and the control surfaces were shown to 'freeze' in one position when the aeroplane attained high speeds in a dive.

Structural issues also afflicted the F-1. Three examples were lost in fatal accidents during February 1941 after pilots had reported over the radio that the airframe was being violently shaken by engine vibrations at high speed. Examination of the wreckage showed that the fuselage longerons had been deformed by high-speed flutter to such an extent that the tail assembly had broken off. When a fourth aircraft suffered a similar fate, it was found that rivets fastening the aft fuselage skinning had been torn loose or were missing altogether. This had been caused by the insufficient stiffening of joints between the fuselage and empennage, allowing the engine at certain speeds to create a resonant vibration of the non-braced horizontal stabiliser. This literally tore off the tail. Two external stiffeners were added to either side of the affected area and the problem was solved.

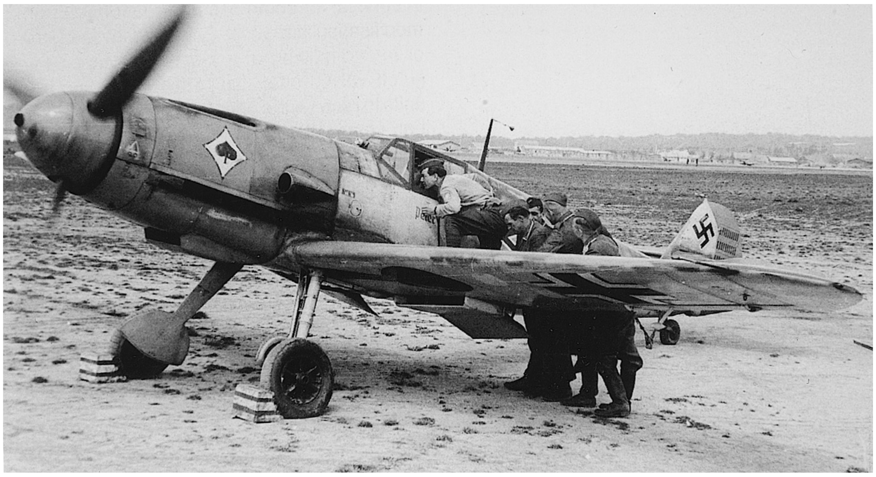
The MG FF/M cannon was also prone to jamming due to insufficient cooling and the main landing gear hydraulic braking system frequently failed.

Bf 109F-2

Series production of the F-2 began at the WNF plant in November 1940, the factory taking delivery of the first examples of the new MG 151/15 cannon at the same time. Although the Luftwaffe had initially planned to acquire just 120 F-2s, more than 1,350 were eventually delivered by the time production ended in August 1941. The F-1 and F-2 were very similar externally, with both variants being powered by the DB 601N engine due to ongoing supply problems with the DB 601E. The F-2 was, however, fitted with the engine-mounted MG 151/15 15mm cannon. From the early summer of 1941 examples of the fighter-bomber F-2/B began to reach frontline units in the West, and these aircraft were assigned to specially formed *Jabos* (short for *Jagdbombers*) within JG 2 and JG 26. Fitted with an ETC 500/IXb centreline-mounted bomb rack, they could carry a single 250kg SC 250 bomb, or four 50kg SC 50 bombs in combination with an ETC 50/VIId rack.

The F-2 was also the first 'Friedrich' capable of mounting a 300-litre under-belly drop tank, examples of which reached Channel Front units in the late summer of 1941. Bf 109Fs of JG 2 and JG 26 were rarely seen with such tanks fitted, however, as most fighter-only missions flown by these units were short-range operations in defence of local areas being targeted by the RAF.

As with the F-1 before it, the F-2 was plagued with teething troubles. Indeed, these proved to be so serious that the commander of Belgium-based *Luftflotte* 2,



Bf 109F-2 Wk-Nr 6674 of II./JG 53, assigned to *Gruppenkommandeur* Hauptmann Heinz Bretnütz, has its DB 601N engine run up at St Omer-Clairmarais in early May 1941. The fighter has been fitted with a telescopic sight, which protrudes through the windscreen and was a popular addition in the frontline to aircraft flown by *Experten*. This aeroplane has 30 victory bars on its rudder, the last of these representing a Spitfire claimed by Bretnütz south of Dungeness on 3 May 1941. He was credited with two more victories prior to JG 53 being posted to the Eastern Front in June, where Bretnütz died of wounds on the 27th of that same month. (John Weal)

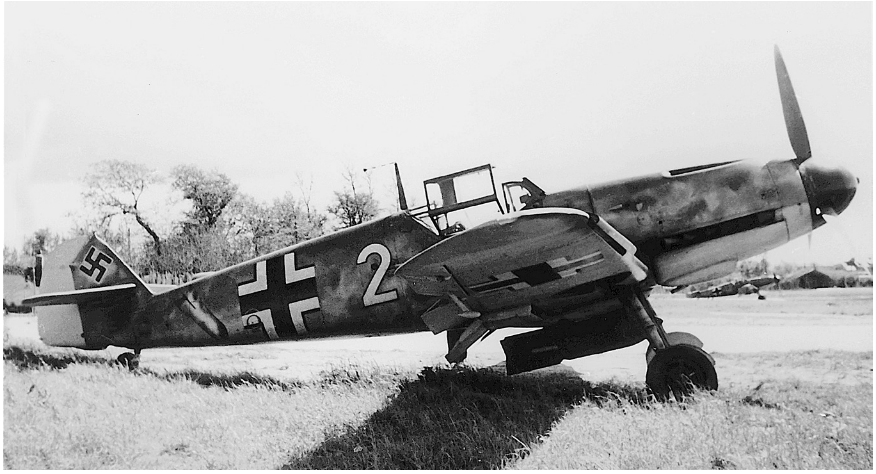
Generalfeldmarschall Albert Kesselring, submitted a 24-point report to the RLM in April 1941 detailing what needed fixing. The most pressing problem was the repetition of the tail section failure that had afflicted the F-1. Other areas of concern included inadequate breathing equipment for high-altitude flying; loose ammunition boxes; wing surface deformation; aileron fabric pulled out of shape; excessive tyre wear on concrete runways, resulting in changes after just 20 sorties; widely variable fuel consumption for aircraft from different manufacturers due to poorly tuned engines; supercharger ball-bearing failure after only five hours of engine operation; high wear of DB 601Ns due to leaking valves, resulting in engine changes after just 40 hours; and reduced altitude performance of repaired engines. The majority of the areas highlighted by Kesselring were addressed with the F-4.

Bf 109F-3

Just 20 F-3s were assembled by the WNF plant between October 1940 and January 1941, this variant being the first production 'Friedrich' to feature the long-awaited DB 601E engine. It was, however, armed with the older, obsolescent MG FF/M 20mm cannon (along with the standard twin MG 17 7.92mm machine guns) due to a paucity in the supply of MG 151/15s. The MG FF/M proved to be so unreliable in frontline service with the F-1/3 that production of the fighter was soon halted as more F-2s became available.

Bf 109F-4

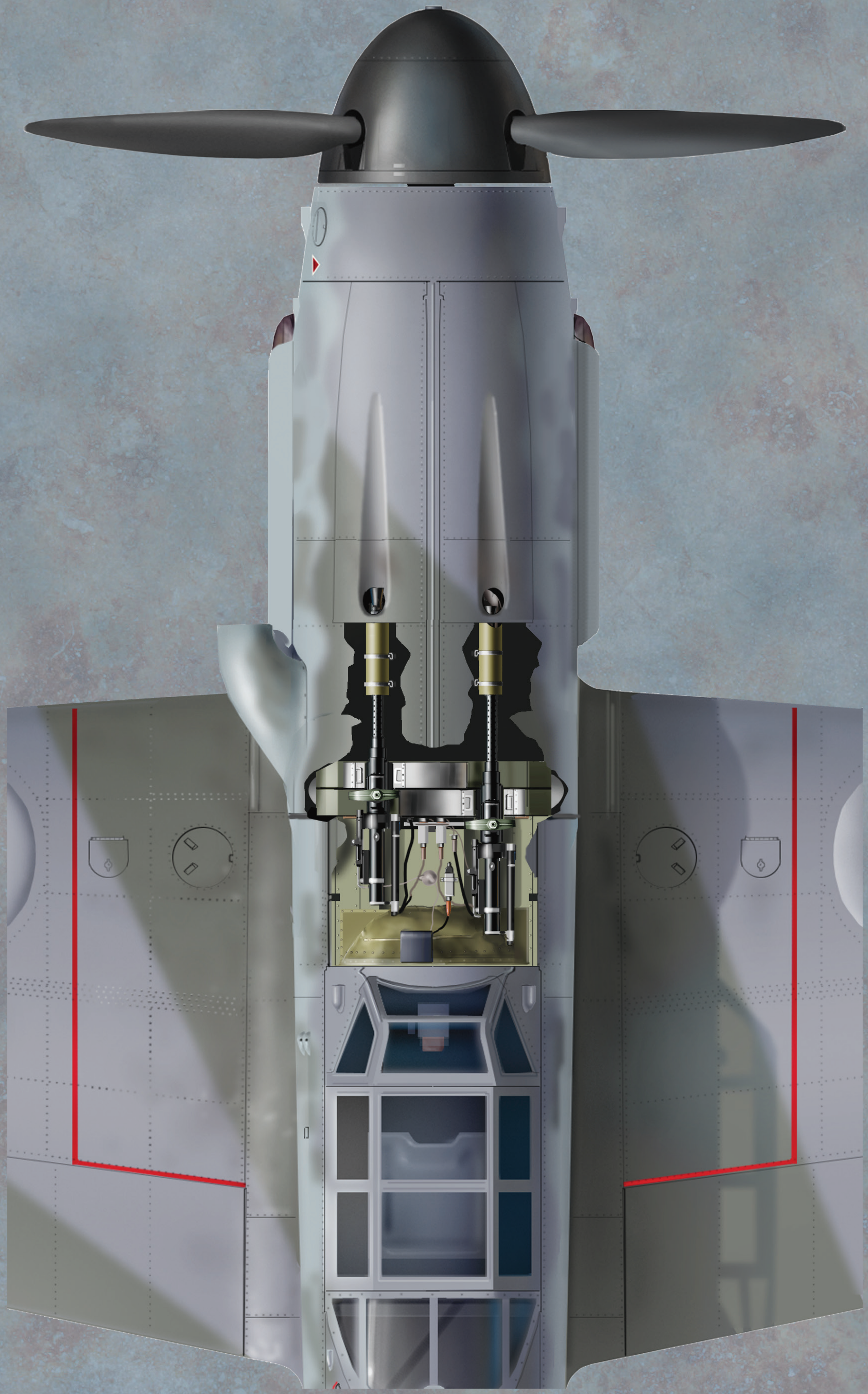
The most numerous 'Friedrich' variant, the F-4 was in production for exactly a year from May 1941. In that time the Erla and WNF factories had turned out 1,883 examples between them. Almost identical in appearance to the F-2, the F-4 had its internal tail structure redesigned (and external reinforcement strips removed) to eradicate the vibration problems that had plagued earlier aircraft. The fighter also boasted extra armour for the pilot, as well as a bolt-on armoured glass plate for the windscreen. But the F-4's greatest advantage over previous variants was its DB 601E engine rated at 1,350hp. At least 600 aircraft were completed as F-4/Zs, incorporating the GM 1 temporary engine boost system which enabled nitrous oxide to be directly injected into the DB 601E's cylinders to increase the fighter's high-altitude



Seen at Caen-Carpiquet laden down with an SC 250 bomb on its centreline ETC 500 rack, Bf 109F-4/B Wk-Nr 8352 of 10(*Jabo*)./JG 26 was flown by Feldwebel Otto Görtz during a *Jabo* attack on the Bournemouth area on the evening of 6 June 1942. The fighter was shot down by anti-aircraft fire during the mission, Görtz being killed. (EN-Archive)

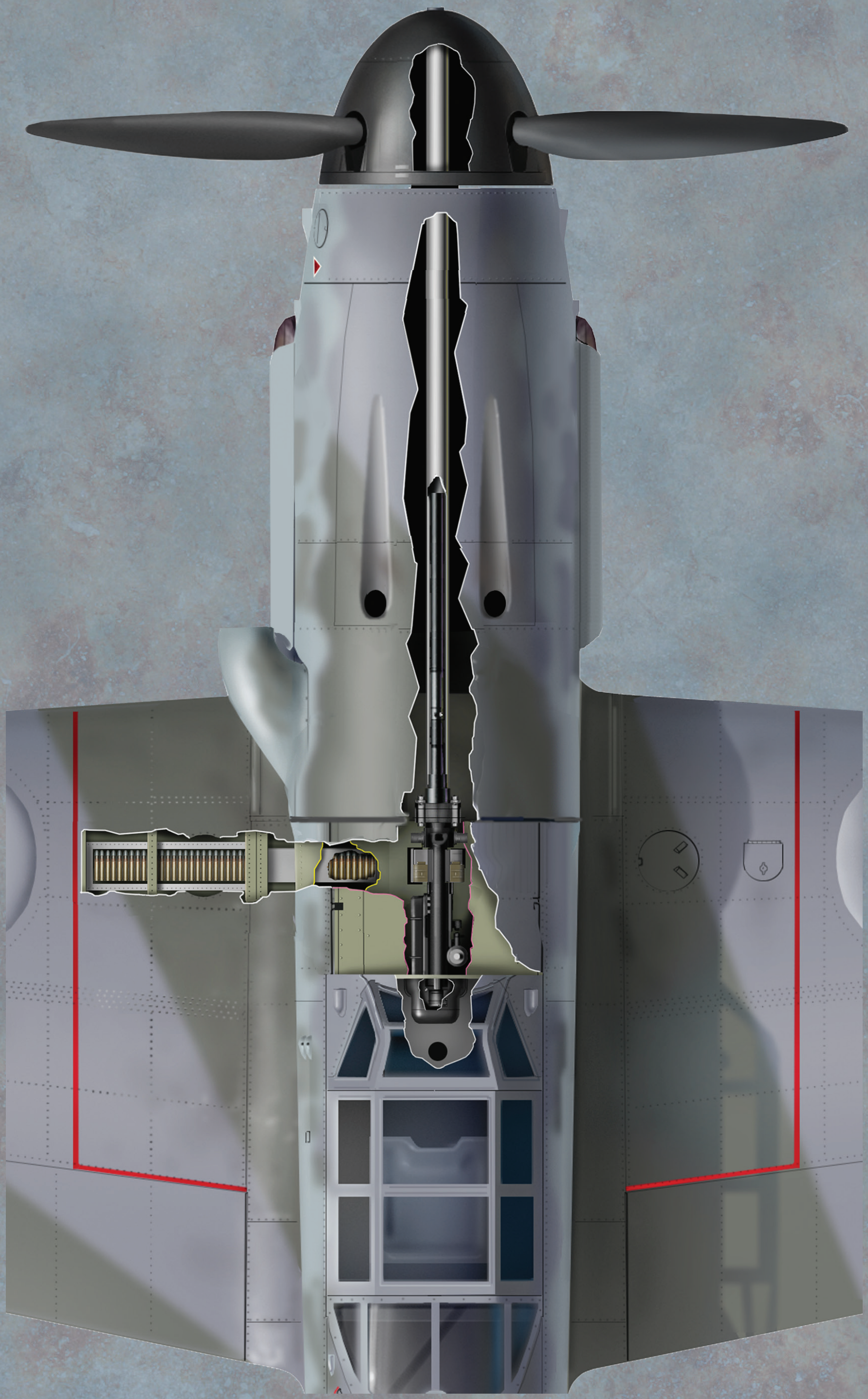
Bf 109F MACHINE GUNS

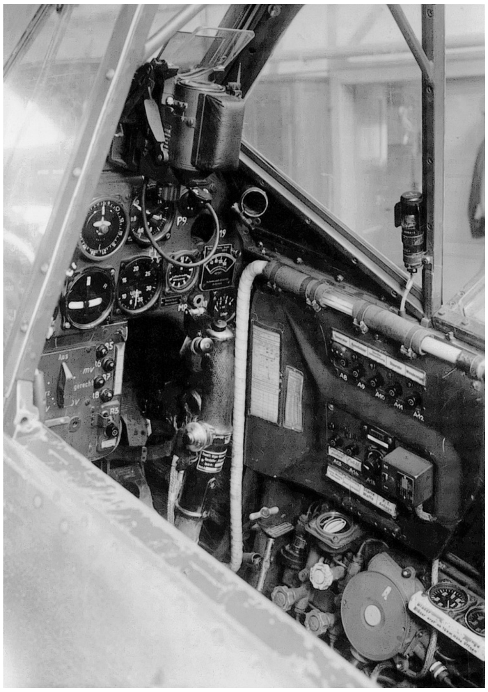
Designed with aerial combat operations in mind, the Bf 109F had all of its weapons grouped in the nose to give their rounds line-of-flight trajectory. This advantage was somewhat offset by the fact that the aircraft carried just three guns. Like the Bf 109E before it, the 'Friedrich' was armed with a pair of Rheinmetall MG 17 7.92mm machine guns in the nose. Each weapon had a 500-round magazine, mounted forward of the cockpit. The MG 17s were synchronised with the engine to avoid damaging the propeller when they were fired. The weapons were recoil-operated, electrically fired by a solenoid and gas-assisted, with pneumatic charging by means of compressed air bottles housed in the rear fuselage or wings.



Bf 109F-2/4 CANNON

The Bf 109F's principal weapon was an engine-mounted automatic cannon – the 20mm MG FF/M in the F-1, the 15mm Mauser MG 151/15 in the F-2 and the 20mm MG 151/20 in the definitive F-4. The F-2 and F-4 had a wing root magazine holding 200 rounds of ammunition, while the F-1's MG FF/M had just 60 rounds contained in drums stowed in the cockpit between the pilot's legs. Developed by Mauser, the MG 151 was electrically cocked and fired by electric cartridge detonation and fed by a disintegrating metallic link belt. Boasting a high rate of fire (740 rounds per minute for the MG 151/15 and 750 for the MG 151/20), the MG 151 was one of the best aircraft cannon of World War 2.





The snug confines of the Bf 109F-4 cockpit. This aircraft has the bomb release control box for the ETC rack installed directly beneath the instrument panel. Note also the flow control tubing for the drop tank installation affixed to the right side of the cockpit, the pipework coming up through the floor and running longitudinally aft. Above the instrument panel is the Revi C12D gunsight and left of the flow control tubing is the KG 12A control column grip. (EN-Archive)

performance. The GM 1 reportedly improved the F-4's top speed by 12.5mph at altitudes above 19,500ft. GM 1-equipped F-4s were relatively uncommon on the Channel Front, however.

The aeroplane was also armed with an engine-mounted MG 151/20 20mm cannon and two MG 17 7.92mm machine guns.

As with the F-1 and F-3, the F-4 benefitted from Messerschimitt's *Rüstzätze* (add-on) programme that saw a variety of equipment kits made available to tailor an aircraft to specific operational requirements. With the earlier variants, four *Rüstzätze* 'R' kits could be used to convert the aeroplane into a fighter-bomber, carrying 24 anti-personnel bombs (Bf 109F-2/R4), four 50kg weapons (Bf 109F-2/R2) or a single 250kg bomb (Bf 109F-2/R1), or give it an extended-range fighter capability through the provision of a 300-litre drop tank (Bf 109F-2/R3).

There were more 'R' kits for the F-4, with the R1 seeing the fighter 'up-gunned' with two MG 151/15 or MG 151/20 cannon mounted in underwing gondolas. These weapons were prone to jamming, however, and only a handful of aircraft were produced by WNF and tested by I./JG 52 on the Eastern Front in May 1942. Five photo-reconnaissance R2s and 36 R3s fitted with a single camera were constructed by the Erla plant. The R5 could be fitted with a 300-litre external tank, while the R4 and R8 were one-off reconnaissance models featuring larger cameras than the R2 and R3. F-4s lacking GM 1 or underwing cannon could perform fighter-bomber missions as F-4/Bs through the installation of the 'R' kits.

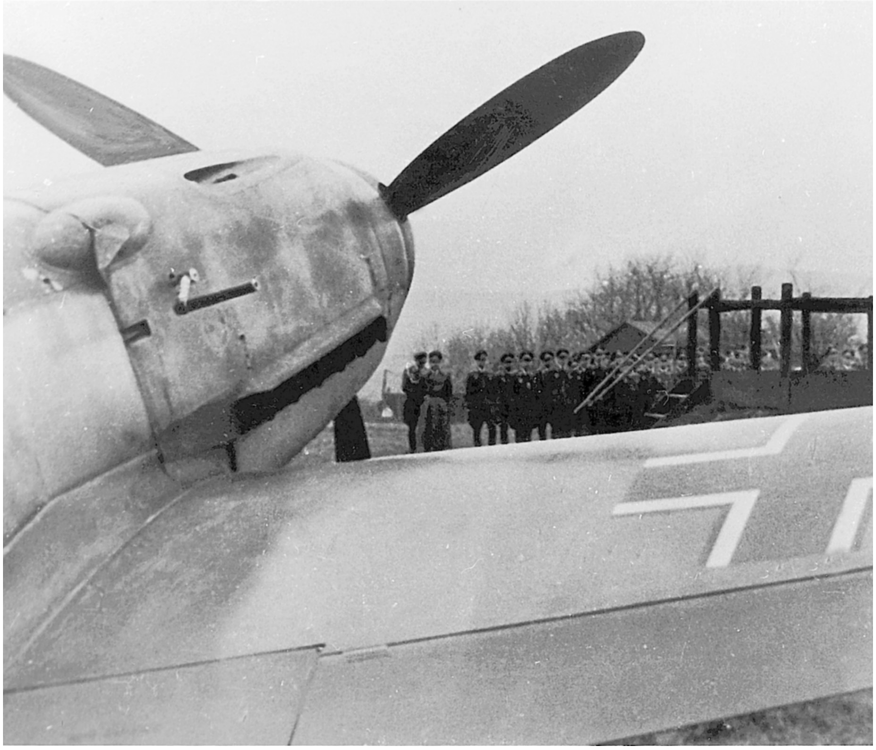
Bf 109F-5 AND F-6

The F-5 was proposed by Willy Messerschmitt during the summer of 1941 as a dedicated high-altitude interceptor and reconnaissance aircraft based on the F-2. Powered by a GM 1-boosted DB 601N running on 100-octane fuel, it would have been armed with an MG 151/20 20mm cannon. His proposal met with little interest from the RLM, however, and it appears that only one example was completed.

The Luftwaffe had planned to acquire 1,281 F-6s according to its October 1940 production programme. This variant was based on the F-2 and also fitted with a DB 601N running on 100-octane fuel. The F-6 was to be more heavily armed, however, following complaints from pilots (including Oberst Adolf Galland, *Geschwaderkommodore* of JG 26) that the 'Friedrich' was lacking in firepower. The standard F-6 was to be fitted with an engine-mounted MG 151/20 cannon, two cowl-mounted MG 17 7.92mm machine guns and two additional MG FF/M cannon in the wings. As with the F-4/R1, few F-6s were built, as both Messerschmitt and the RLM turned their attention to the follow-on G-model, which incorporated additional weaponry and utilised the more powerful DB 605 engine. One F-6/U, fitted with extra cannon in the wings, was briefly used in combat by Adolf Galland in November 1941 on the Channel Front. The ace also flew a similarly unique Bf 109F-2/U1, which was armed with a single MG 151/15 and two MG 131 13mm machine guns in place of the MG 17s.

Spitfire IIA, Spitfire VB, Bf 109F-2 and Bf 109F-4 Comparison Specifications

	Spitfire IIA	**Spitfire VB**	**Bf 109F-2**	**Bf 109F-4**
Powerplant	1,135hp Merlin XII	1,470hp Merlin 45	1,270hp DB 601N	1,350hp DB 601E
Dimensions				
Span	11.23m (36ft 10in)	11.23m (36ft 10in)	9.92m (32ft 5.4in)	9.92m (32ft 5.4in)
Length	9.12m (29ft 11in)	9.12m (29ft 11in)	8.94m (29ft 3.2in)	8.94m (29ft 3.2in)
Height	3.02m (9ft 10in)	3.48m (11ft 5in)	2.6m(8ft 5.3in)	2.6m (8ft 5.3in)
Wing area	22.5 sq m (242.1 sq ft)	22.5 sq m (242.1 sq ft)	16.1 sq m (173.3 sq ft)	16.1 sq m (173.3 sq ft)
Weights				
Empty	2,059kg (4,541lb)	2,251kg (4,963lb)	2,355kg (5,190lb)	2,392kg (5,272lb)
Loaded	2,799kg (6,172lb)	3,071kg (6,525lb)	2,780kg (6,127lb)	2,832kg (6,242lb)
Performance				
Maximum speed	570km/h at 5,349m (354mph at 17,550ft)	597km/h at 6,096m (371mph at 20,000ft)	598km/h at 6,100m (371mph at 20,000ft)	610km/h at 6,000m (379mph at 19,680ft)
Range	651km (405 miles)	760km (470 miles)	580km (360 miles)	560km (350 miles)
Service ceiling	11,460m (37,600ft)	10,668m (35,000ft)	11,000m (36,000ft)	12,000m (39,350ft)
Armament	8 × 0.303-in. Brownings	2 × 20mm Hispano IIs 4 × 0.303-in. Brownings	1 × 15mm MG 151/15 2 ×7.92mm MG 17	1× 20mm MG 151/20 2 × 7.92mm MG 17



The one-off Bf 109F-2/U1 sits on the airfield at Audembert on 5 December 1941. It was modified to carry two MG 131 13mm machine guns in the upper engine cowling in place of the F-2's MG 17 7.92mm weapons. Note the blisters covering the gun breeches and ammunition feeds and the deeper and blast troughs for the MG 131 armament. This aircraft was one of two or three specially modified for Oberst Adolf Galland after he stated that the standard F-model was under-armed. This photograph was one of a series taken during and after the change of command ceremony that saw Galland replaced by Major Gerhard Schöpfel as *Kommodore* of JG 26. (EN-Archive)

THE STRATEGIC SITUATION

When the first Spitfire IIAs began to reach frontline units in late August 1940, the outcome of the Battle of Britain was still very much in the balance. Indeed, initial deliveries to No. 611 Sqn at Digby, in Lincolnshire coincided with the deadliest phase of the campaign as the Luftwaffe concentrated its attacks on Fighter Command's No. 11 Group airfields in southeast England. No. 611 Sqn was part of No. 13 Group, however, and its early operations with the Mk II consisted of patrols with the fledgling Duxford 'Big Wing', led by Sqn Ldr Douglas Bader. By the end of September four more units (Nos. 266, 74, 19 and 66 Sqns, in that order) had replaced their battle-weary Spitfire Is with new 'Shadow factory' Mk IIAs. During the course of that month the Luftwaffe switched its attacks to London in the hope that a killer blow could be dealt to the RAF once and for all. This, of course, proved to be a critical error which ultimately saved Fighter Command from annihilation at the hands of a numerically superior enemy.

In October two more units (Nos. 41 and 603 Sqns) received Spitfire IIAs as the rate of production increased at the West Bromwich plant. By then the terrible losses suffered by the Luftwaffe during raids on London the previous month had forced yet another change in its offensive. German fighters could only secure local air superiority – as they had done earlier in the campaign and during the *Blitzkrieg* in Poland and western Europe – by sending over several *Geschwader* at once. Even then, contrary to Luftwaffe intelligence reports that Fighter Command was on its last legs, Bf 109 and Bf 110 units were sustaining unbearable losses trying to defend bomber formations from attacks from increasing numbers of Spitfires – many of them new Mk IIAs – and Hurricanes.

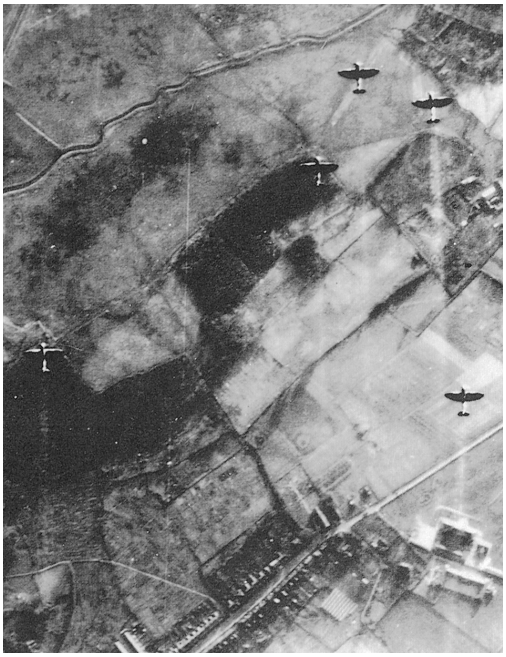
In early October the Luftwaffe decided that the only way to reduce bomber losses was to switch to nocturnal raids. The result was the start of the night *Blitz*. However, bomb-equipped Bf 109s and Bf 110s (*Jabos*) would carry out nuisance raids by day, while the increasingly combat-weary *Jagdgeschwader* maintained the pressure on an ever-enlarging Fighter Command with frequent 'Freie Jagd' ('Free Hunt') sweeps over southern England. These missions were both exciting and productive for the more seasoned *Experten* who had survived the previous month's blood-letting. They certainly kept squadrons of Nos. 10 and 11 Groups busy even though they were no more than a nuisance to Fighter Command. Compared with the large formation attacks by fighters and bombers in August and September, they posed no threat to its existence.

With the RAF stronger now than it had been at the start of the Battle of Britain some three months earlier, the *Führer* had no option but to cancel the invasion of Britain (Operation *Sealion*) on 17 October and turn his attention eastwards to the USSR. The Luftwaffe maintained its daily attacks on southern England, however, with escorted *Jabos* appearing more and more frequently in the skies over Kent and Sussex. They would approach at high speed, usually taking advantage of mixed weather conditions and often flying at altitudes exceeding 32,000ft, where the Bf 109E performed better than either the Hurricane or the Spitfire I/II.

In October early production examples of the brand-new Bf109F reached JG 51 at Mardyck, near Dunkirk, to further compound the RAF's problems defeating the high-altitude threat posed by the *Jabos* and their escorts. Although only initially available in small numbers due to production delays, the F-models encountered by Fighter Command proved to be all but untouchable if their pilots chose to remain at altitudes in excess of 32,000ft. Alarmingly for the Spitfire and Hurricane pilots trying to intercept these machines as they flew in from the Channel, the 'Friedrich' was even more capable of operating at such ceilings than the late-model 'Emils' they had been struggling to counter.

Fighter Command controllers on the ground were finding it impossible to distinguish 'Freie Jagd' fighter-only sweeps, which posed little threat to southeast England and London, from escorted *Jabo* raids that could still cause damage and civilian deaths due to the inaccuracy of their bombing from high altitude, or from conventional bombers. The RAF had to adopt new tactics. The solution devised by ACM Sir Hugh Dowding, Air Officer Commanding Fighter Command, was to create a specialist fighter unit, No. 421 Flt, manned by experienced pilots and initially equipped with Hurricane Is and eventually Spitfire IIAs. Its task was to patrol the Channel and identify which incoming raids were *Jabos* and which were fighter sweeps. Formed in late September 1940 and based at Hawkinge, on the Kent coast, the unit would send out aircraft alone or in pairs throughout daylight hours.

Although No. 421 Flt proved very successful in this role, the RAF still had to mount standing patrols if it was to have any hope of engaging the high-flying *Jabos*.



This unusual photograph of Spitfires over Snodland, in Kent, was taken on 21 December 1940 by a high-flying Bf 110C reconnaissance aircraft of 7(F)./LG 2 that the RAF fighters were trying to intercept. Twenty-three Spitfire I/IIs from Nos. 64 and 611 Sqns took part in the mission and they claimed to have damaged their opponent, which they wrongly identified as a 'Do 215B'. Although the Bf 110's gunner was indeed shot dead, the Messerschmitt escaped to make a crash-landing at Mardyck, near Dunkirk. Spitfires climbing hard to engage high-flying reconnaissance aircraft and Bf 109/110 *Jabos* were a feature of the final weeks of 1940. (Dr Alfred Price)

Spitfire IIA P7490 *City of Coventry I* sits on the grass at No. 66 Sqn's dispersal at Biggin Hill in early November 1940. Sharing 'LZ' codes with No. 421 Flt (the latter unit added a 'dash' between the 'L' and 'Z'), Fighter Command's second-oldest Spitfire squadron helped sire the specialist fighter unit – which eventually became No. 91 Sqn – tasked with patrolling the Channel to identify which incoming raids were *Jabos* and which were fighter sweeps. Aside from providing the flight with two experienced sergeant pilots, No. 66 Sqn also equipped it with several Spitfire IIAs. P7490 was not one of them, however. The first of three consecutively serialled Mk IIAs paid for by the residents of Coventry and all issued new to No. 66 Sqn, P7490 enjoyed a long service career that included spells with Nos. 609, 65, 122 and 154 Sqns, prior to it being converted into a Spitfire ASR(IIC) in 1942 for the air-sea rescue role. (Peter Hall)

With the Spitfire IIA being the only aircraft capable of climbing from patrol height to 30,000ft fast enough to intercept the Bf 109s, the burden fell on the handful of suitably equipped units in No. 11 Group to fly these often costly and ineffective but nevertheless vital missions. When the enemy was encountered, the advantage was definitely with the *Jagdflieger*, who were frequently in a position to surprise their foes by diving out of the sun on climbing British fighters. Yet despite the victories achieved by the Luftwaffe, and the reduced number of casualties it was experiencing due to the change in tactics, the RAF's fighter strength continued to grow to the point where, by December 1940, offensive operations were being considered.

The previous month both ACM Dowding and Air Vice Marshal (AVM) Keith Park, commander of No. 11 Group during the Battle of Britain, had been controversially replaced. Dowding's successor, ACM Sir W. Sholto Douglas, was asked by ACM Sir Charles Portal for his opinion on a suggestion made to him by Viscount Trenchard who had led British air forces in World War 1. Always keen to take the fight to the enemy, Trenchard had told Portal in late 1940 that it was perhaps time to take the offensive now that the major daylight raids by the Luftwaffe were seemingly over. 'Lean towards France' was Trenchard's advice. Such missions would invariably involve the squadrons of No. 11 Group, now commanded by AVM Trafford Leigh-Mallory, previously of No. 12 Group, because of their proximity to France.

Douglas initially opposed Trenchard's suggestion. As a fighter unit commander in France during World War 1, he was painfully aware of the cost of such offensives both in pilots and aircraft. On the other hand, it would prove to the Germans that the RAF was more than capable of taking the fight to them after many months of purely defensive operations. Douglas reluctantly agreed that incursions across the Channel might well meet with some success. With No. 11 Group in the vanguard of such an offensive, AVM Leigh-Mallory saw that his controversial 'Big Wing' idea could at last prove its worth.

He and his predecessor, AVM Park, had clashed repeatedly during the summer of 1940 over the time it took No. 12 Group to assemble four squadrons into wing formation and then head south to help No. 11 Group defend southern England from Luftwaffe attacks. Leigh-Mallory's squadrons in the quieter No. 12 Group area had time to takeoff and assemble before searching for enemy aircraft, but Park's units were very much in the frontline during the campaign. With their airfields, or nearby London, often the target for approaching German bombers, it was all that the No. 11 Group squadrons could do to get airborne and intercept them before they unleashed their deadly payloads. There was no time to form up in larger wings prior to engaging the Luftwaffe.

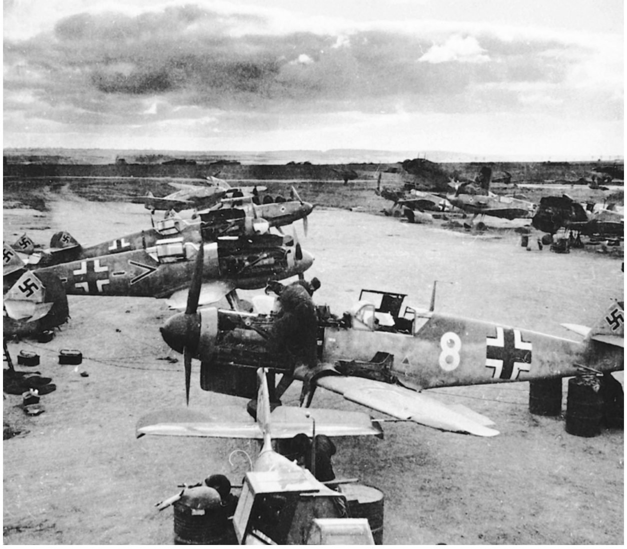
Having assumed command of No. 11 Group, Leigh-Mallory was keen to implement his wing concept in support of this new offensive. Without the urgency of engaging approaching Luftwaffe bombers, the squadrons involved in such an operation could take-off and form up in good order before heading off to northern France. It was quickly decided that each of the Sector Stations in No. 11 Group – Kenley, Tangmere, Northolt, Biggin Hill, North Weald, Debden and Hornchurch – and Duxford, in No. 12 Group, would create their own wing formations from the squadrons (usually four each) under their control. Each wing would be led by an experienced pilot with known fighting ability and the presence of mind to control up to four squadrons in combat. Officially, the first wing leaders were appointed in early March 1941, although by then a handful of 'Circus' operations had already been mounted, led by the most senior pilot or by the most experienced squadron commander from the Sector Station providing the fighter escort.

Plt Off J. E. 'Johnnie' Johnson of No. 616 Sqn was an early participant in the first offensive sweeps made by the Tangmere Wing over France in 1941. Not a great fan of such missions, he particularly detested the ground-attack oriented 'Rhubarbs'. 'Apart from the flak, the hazards of making a let-down over unknown territory and with no accurate knowledge of the cloud base seemed too great a risk for the damage we inflicted,' he wrote. 'Hundreds of pilots were lost on either small or mass "Rhubarbs".' Johnson would end the war as Fighter Command's ranking ace. (Andrew Thomas)

Flg Off Hugh Dundas, who was assigned to No. 616 Sqn at Tangmere when the first wing leaders were appointed, recalled their creation in his autobiography *Flying Start*:

> His [AVM Leigh-Mallory's] first step was to establish a new post at each Sector Station – the post of 'Wing Commander Flying'. Previously, each individual squadron commander had been responsible directly to the station commander (sometimes, indeed quite often, the station commander was also the sector commander). If more than one squadron flew together as a formation, the senior squadron commander would lead. Now, the new wing commanders flying – or wing leaders, as they came to be called – assumed responsibility for coordinating all flying activities and for leading the wing formations. To Tangmere, for these duties, came Douglas Bader.

The very first offensive operation undertaken by Fighter Command had, in fact, been flown as early as 20 December 1940, when a pair of Spitfire IIAs led by Flt Lt Pat Christie of No. 66 Sqn strafed Le Touquet airfield. This was the first time Spitfires had operated over France since the French surrender. As the New Year dawned there was a marked change in operational emphasis, Fighter Command slowly adopting an offensive posture to take the fight to the enemy. Initially, small numbers of Spitfires and Hurricanes flew to France, but soon larger operations in which fighters escorted bombers were being routinely flown. Blenheim IVs and, later, Stirling four-engined heavy bombers were involved in these attempts to draw Luftwaffe fighters into battle. Thus, Pat Christie, a



A busy scene at I./JG 53's St Omer Arques home in March–April 1941. Mechanics can be seen working on the engines of a number of brand-new Bf 109F-2s from both the *Stabsschwarm* and I. *Gruppe*. The fighter with *Stab* markings (black chevron and bars) was a reserve machine for the *Kommodore* of JG 53, Major Günther von Maltzahn. The number '2' just visible inside the chevron denotes its reserve status. Surviving the war with 67 victories to his name, von Maltzahn claimed four Spitfires shot down with the F-model on the Channel Front between 31 March and 9 May 1941. (EN-Archive)

OPPOSITE

This map shows the location of Fighter Command and Jagdwaffe airfields during the Channel Front campaign. The modest operational range of a standard Spitfire II/V is also shown, as well as the general path flown by Bf 109E/F fighters on offensive patrols over southern England and the Channel from the Pas-de-Calais.

six-victory ace, had paved the way for countless offensive sorties by the RAF over the next three years. The operational codenames of 'Circus', 'Ramrod', 'Rodeo', 'Rhubarb', 'Ranger' and others quickly became achingly familiar to RAF fighter pilots.

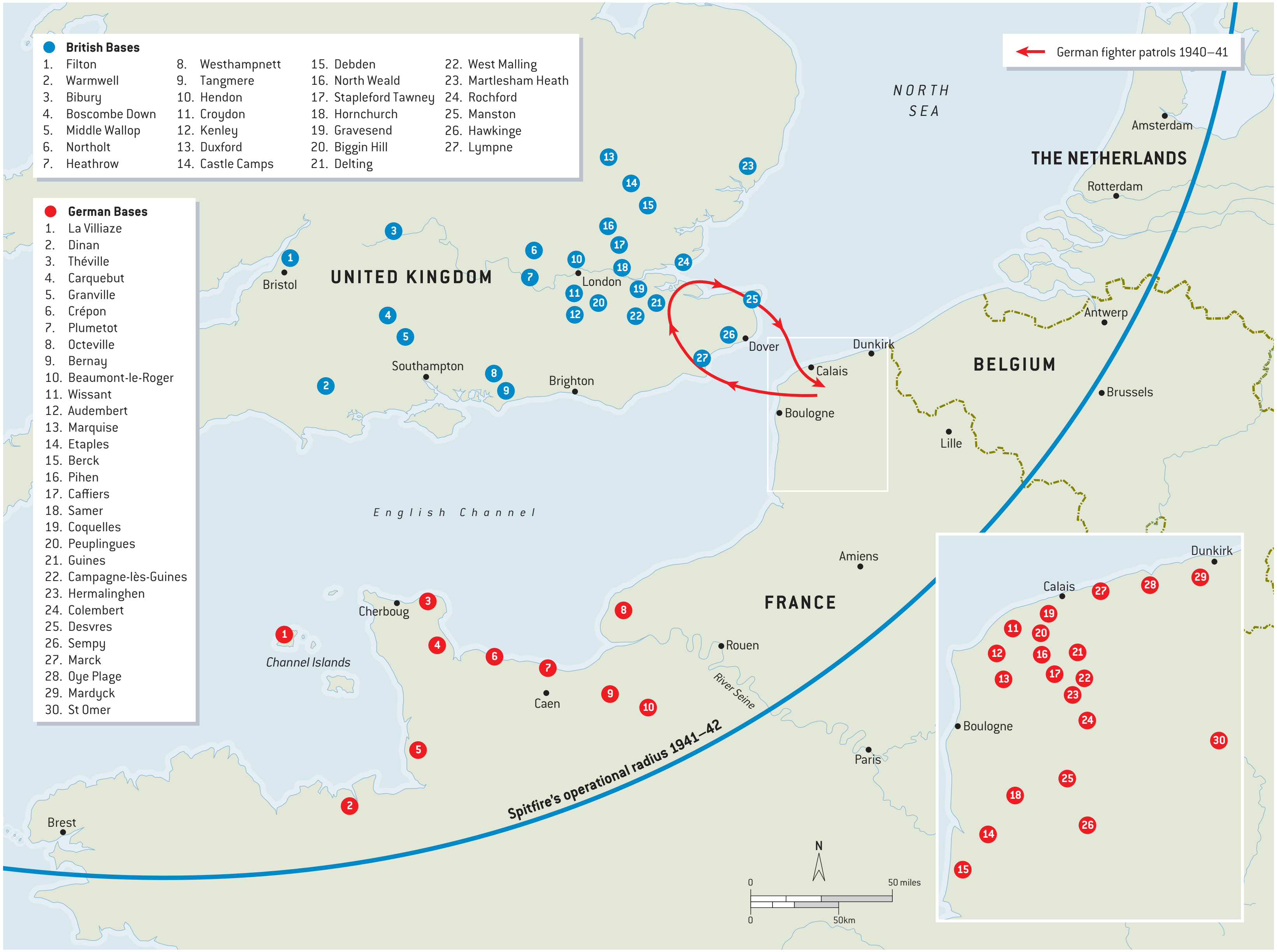
A 'Rhubarb' was an offensive sortie by a small section of fighters, usually pairs, to attack targets of opportunity such as trains, or fixed targets. 'Circus' denoted an attack by bombers heavily escorted by fighters, the presence of the former being to entice enemy fighters into combat. On a 'Ramrod', bombers, again heavily escorted by fighters, had the primary task of destroying a target. In contrast, a 'Ranger' was a sweep in which a large formation of fighters flew a freelance intrusion over enemy territory with the express aim of destroying German fighters.

The new offensive policy would generally be implemented by units flying from bases in central and southern England assigned to Nos. 10, 11 and 12 Groups. On 1 January 1941 Fighter Command fielded 15 Spitfire squadrons split between No. 11 Group in southern England, No. 12 Group in the Midlands and No. 10 Group in the west. These units were easily reinforced when required.

As with the 'Freie Jagd' sweeps mounted by the Luftwaffe over southern England from October 1940 through to the end of the year, RAF fighters flying 'Rhubarbs' were generally ignored by the Jagdwaffe. The inclusion of light bombers did, however, provoke a response. Fighter Command soon discovered that providing an effective escort for Blenheim IVs was not easy. A large number of fighters ('Ramrods') would eventually be involved, and sometimes as many as 15 squadrons of fighters could be over France escorting no more than 12 bombers targeting a power station or port facility. It was now the RAF's turn to endure the disadvantages experienced by the Luftwaffe during the Battle of Britain, when its squadrons had to operate at maximum range over hostile territory with a long overwater flight to and from the target.

One of the men charged with implementing this new offensive policy was No. 616 Sqn's Plt Off J. E. 'Johnnie' Johnson, the future ranking ace of Fighter Command. A fighter pilot through and through, he was no fan of the ground-attack oriented 'Rhubarbs' in particular, as he explained in *Winged Victory*:

> The 'leaning out' doctrine included low-level flights over France known as 'Rhubarbs'. The idea was to take full advantage of low cloud and poor visibility to slip sections of Spitfires across the coast, then let-down below the cloud to search for opportunity targets, rolling stock, locomotives, aircraft on the ground, staff cars, enemy troops and the like. They were usually arranged on a voluntary basis and a few pilots seemed to prefer this type of individual, low-level work to the clean, exhilarating teamwork of the dogfight. But the great majority of fighter pilots thought privately that the dividends yielded by the numerous 'Rhubarb' operations fell far short of the cost in valuable aircraft and trained pilots.


British Bases
1. Filton
2. Warmwell
3. Bibury
4. Boscombe Down
5. Middle Wallop
6. Northolt
7. Heathrow
8. Westhampnett
9. Tangmere
10. Hendon
11. Croydon
12. Kenley
13. Duxford
14. Castle Camps
15. Debden
16. North Weald
17. Stapleford Tawney
18. Hornchurch
19. Gravesend
20. Biggin Hill
21. Delting
22. West Malling
23. Martlesham Heath
24. Rochford
25. Manston
26. Hawkinge
27. Lympne
German Bases
1. La Villiaze
2. Dinan
3. Théville
4. Carquebut
5. Granville
6. Crépon
7. Plumetot
8. Octeville
9. Bernay
10. Beaumont-le-Roger
11. Wissant
12. Audembert
13. Marquise
14. Etaples
15. Berck
16. Pihen
17. Caffiers
18. Samer
19. Coquelles
20. Peuplingues
21. Guines
22. Campagne-lès-Guines
23. Hermalinghen
24. Colembert
25. Desvres
26. Sempy
27. Marck
28. Oye Plage
29. Mardyck
30. St Omer
German fighter patrols 1940–41
NORTH SEA
Amsterdam
THE NETHERLANDS
Rotterdam
Antwerp
BELGIUM
Brussels
Lille
UNITED KINGDOM
Bristol
London
Southampton
Brighton
Dover
Dunkirk
Calais
Boulogne
English Channel
Amiens
FRANCE
Rouen
River Seine
Cherboug
Channel Islands
Caen
Paris
Brest
Spitfire's operational radius 1941–42
N
0
50 miles
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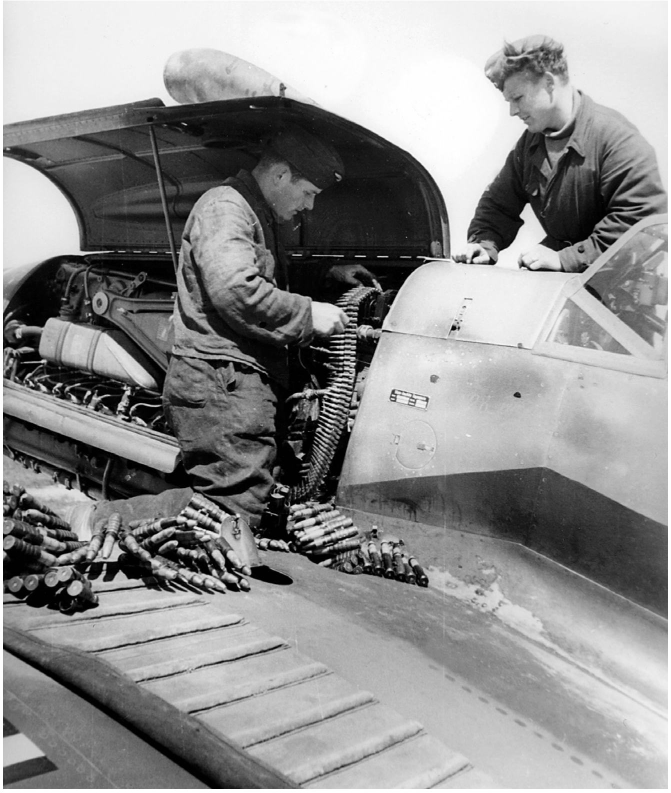
50km
Dunkirk
Calais
Boulogne



A Bf 109F of JG 2 has its MG 17 and MG 151/20 guns replenished. The latter was belt-fed from an ammunition box located in the front part of the upper surface of the port side wing only. (EN-Archive)

> I loathed those 'Rhubarbs' with a deep, dark hatred. Apart from the flak, the hazards of making a let-down over unknown territory and with no accurate knowledge of the cloud base seemed too great a risk for the damage we inflicted. During the following three months, hundreds of pilots were lost on either small or mass 'Rhubarbs' and, when I later held an appointment of some authority at No. 11 Group, my strong views on this subject were given a sympathetic hearing and 'Rhubarbs' were discontinued over France, except on very special occasions.

For the Jagdwaffe, the start of the Fighter Command offensive in early January 1941 came at a time when many of its units in France and Belgium had been stood down for rest and recuperation following months of intensive operations that had inflicted a heavy toll on them. Although a small number of *Jabo* missions continued to be flown against targets in southern England, the onset of winter had given the units a chance to send *Gruppen* back to Germany to re-equip with either late-build 'Emils' or the latest Bf 109Fs. Decisions on which *Jagdgeschwader* would be the first to receive the still scarce F-1s were made at a meeting of the *Oberkommando der Luftwaffe* Operations Staff in early November 1940. Approximately 12 aircraft would be delivered to one *Staffel* each of JG 2, JG 27 and JG 51. JG 27 was later replaced by JG 26, however, so that the fighter could be introduced into combat with units led by the best-known commanders at the time – Major Helmut Wick (killed in action before JG 2 received Bf 109Fs), Oberstleutnant Adolf Galland and Major Werner Mölders.

Although as many as eight *Jagdgeschwader* (admittedly not all at full strength) opposed the RAF offensive during the first six months of 1941, following the invasion of the Soviet Union in June, only JG 2 and JG 26 remained on the Channel Front to counter the raids. JG 2 was given responsibility for an area from Cherbourg northeast to the River Seine estuary, while JG 26 continued the defensive line from the Seine to the coast of Holland. These two units would be Fighter Command's principal opponents for the rest of the war. At best, these *Jagdgeschwader* typically had around 250 fighters at their disposal, although fluctuating serviceability rates often reduced this figure. Fielding highly skilled aviators who had seen more than a year of combat, and now receiving the definitive Bf 109F-4, JG 2 and JG 26 would find no shortage of opponents as Fighter Command's ranks continued to swell with more and more Spitfires – Mk IIs and, increasingly, Mk Vs – during the course of 1941.

THE COMBATANTS

Some of the most experienced and successful fighter pilots to serve with the RAF and the Luftwaffe would slug it out on the Channel Front during the period of intense action examined by this book. Many were veterans of combat in the early stages of World War 2, having survived the *Blitzkrieg* in Poland and the Low Countries as well as the fierce fighting of the Battle of Britain. Some of the leading aces of the conflict's first years enjoyed great success flying the Bf 109F or the Spitfire II/V in 1940–42. Many were pre-war aviators who had benefitted from well-established training regimes that involved vastly experienced instructors.

But by September 1940, as the Battle of Britain was reaching its climax, both the RAF and the Luftwaffe found themselves increasingly short of pilots. For Fighter Command in particular this meant corners had to be cut in training to bolster frontline numbers. And once the campaign was over, many aviators – both British and, to a lesser extent, German – were now suffering from combat-fatigue and were duly removed from the frontline and sent to training units as instructors. Their quality varied greatly. Some pilots were well suited to the job but others resented their removal from combat. Among the latter was Flg Off Hugh Dundas, who was posted away from No. 616 Sqn to No. 59 Operational Training Unit (OTU) in the autumn of 1941:

> In retrospect I can see clearly how unenviable and difficult was the task of Air Cdre F J Vincent, who commanded No. 81 Group, with responsibility for all Fighter Command operational training units.

Although an effective fighter pilot who was awarded the DFC and DSO and ended the conflict as both an ace (three of his victories were over Bf 109Fs) and a wing leader, Yorkshireman Hugh 'Cocky' Dundas was not a success as a flight instructor. Indeed, he lasted just three weeks in the job with No. 59 OTU after completing a two-year tour with No. 616 Sqn. Dundas was duly sent back to Fighter Command. (IWM CH 4545)

> His job was supremely important. He had to ensure that a steady flow of competent pilots was continually available to the squadrons. To provide the necessary training Vincent had a collection of instructors of whom some were so operationally fatigued that they had no enthusiasm for the job, while others preferred the comparative safety of instructing to the hazards of squadron life, and were therefore unlikely to imbue their pupils with a proper sense of dash and aggression. Perhaps it was partly in order to counter that situation that Vincent imposed a regime of strict discipline throughout his command. The easy-going habits of dress and behaviour common on all fighter stations were severely discouraged by his unit commanders and Vincent made regular tours of inspection to see for himself that proper standards were being maintained. The imposition of discipline came easy to him, for he had received his early service training in the Royal Marines.
>
> I am afraid that I did nothing to ease the situation for the station commander at Crosby-on-Eden [home of No 59 OTU]. I lasted just three weeks as an instructor. So far as I was ever able to discover, this established a record for brevity which remained unbeaten in Fighter Command throughout the war.

Despite the unsuitability of some instructors, it was not long before RAF fighter squadrons were having to cope with a massive influx of new and untried pilots – many of whom only spoke English as a second language. Although eager to emulate the feats of their predecessors, they had had insufficient time to attain operational status and gain the fighter pilot's mind-set during their brief spell with an OTU. New pilots were often little more than cannon fodder, and grave losses resulted.

With fewer aircraft on the Channel Front, the Jagdwaffe's requirement for pilots was significantly less than Fighter Command's. Nevertheless, the high attrition rate suffered by the *Jagdgeschwader* during the Battle of Britain, when they lost roughly a quarter of their number, meant that they too were in need of replacement pilots by early 1941.

RAF PILOT TRAINING

Having managed to make good the losses of the Battle of Britain, the RAF would never be short of fighter pilots again. Indeed, the 'Few' quickly became the 'Many' as young men poured out of the growing number of OTUs created within Training Command. At the start of the Channel Front offensive, Fighter Command had 71 squadrons, compared with 44 Hurricane and Spitfire units on 1 July 1940. With an increasing number of aircraft, particularly Spitfire IIs and Vs, reaching the frontline, more pilots would be needed to man the new units being hastily formed. By the end of 1940 many of the aviators sent to squadrons in Nos. 10, 11 and 12 Groups were from abroad. Belgian, French, Polish, Czech, Canadian, American, Australian, New Zealand and Rhodesian pilots were liberally distributed throughout the frontline force. Indeed, units staffed exclusively by these nationalities were also being formed.

Thanks to these foreign volunteers, and the thousands of recruits from the UK inspired by the RAF's exploits in the summer of 1940, Fighter Command would always have enough pilots to fill its ranks. The glamorous and dashing image of the World War 1 ace had actually struck a chord with the British public during the inter-war period and this fascination with aviation was fuelled by the national press. When war broke out and the National Service Act came into force, the prospect of compulsory military service pushed many young and talented men towards the more glamorous and somewhat 'safer' RAF. Unfortunately, the fictional image of the ace jarred with the reality of frontline combat, particularly on the Channel Front during 1941–42.

For the young volunteer eager to jump into a Spitfire or Hurricane, the training process would come as a shock. Preparing young men to fly these powerful machines required a great deal of time and expert instruction. After volunteering for aircrew service many applicants were surprised to find themselves going home to await their call-up letter. When it arrived, new recruits reported to an Air Crew Reception Centre (ACRC), where they spent between two and ten weeks. Given the classification of 'aircraftsman second class' upon arrival at the ACRC, the aspiring fighter pilots learned the basics of service life. After the ACRC new recruits were sent to an Initial Training Wing (ITW) where, building on the lessons learned at ACRC, recruits honed their skills with more detailed instruction on meteorology, the principles of flight and drill.

New recruits would encounter the Tiger Moth during short flying courses at an Elementary Flying School where they were used to give students a limited number of hours of dual instruction, and at an Elementary Flying Training School. At the latter, the young recruit would begin a prolonged flying programme where he was taught the relatively simple, but vital, skills of straight and level flight, medium turns, climbing, diving and stall recovery. (Philip Jarrett)

In late 1941 an extra step was introduced to ITW to save time and resources. Short flying courses at an Elementary Flying School (EFS) were arranged to give new students a limited number of hours of dual instruction on de Havilland Tiger Moths or Miles Magisters. After about 12 hours of flying, students needed to show the necessary skills required to go 'solo'. Those unable to do so were reassigned, thereby saving the RAF valuable time and human resources in the later stages of training. Having shown aptitude for flight and been promoted to the rank of leading aircraftsman, successful trainees were now ready for more advanced flying training.

At the Elementary Flying Training School (EFTS) they began a prolonged flying programme on either the Tiger Moth or the Magister. Students were taught the relatively simple but vital skills of straight and level flight, medium turns, climbing, diving and stall recovery. Once these skills had been mastered the student pilot could begin flying circuits, which involved taking off, climbing to a safe height and then flying straight and level downwind parallel to the runway. They then turned and lined the aircraft up for landing, before carrying out a full stop landing. Having mastered these skills, student pilots then flew their first solos. Further instruction included spinning, formation flying and navigation. After successfully logging some 50 hours of flight time, half of which was solo, new pilots moved on. Many students failed EFTS and a good number were listed as KIFA – Killed in Flying Accidents.

The next stage involved an increase in horsepower. Moving on to Service Flying Training (SFT), students were introduced to the North American Harvard or the Miles Master. Both featured dual controls and were far more powerful, with 550hp and 870hp engines, respectively. These aircraft were far more demanding too. The first half of the course involved repeating flights made during EFTS. After a short period, student pilots

After mastering a Tiger Moth or Magister, students progressed to Service Flying Training (SFT). Here they would be introduced to the North American Harvard or the Miles Master. These are Master IIIs of No. 5 FTS, flying from Ternhill, in Shropshire. Both types were dual control and far more powerful, with 550hp and 870hp engines, respectively. These aircraft were far more demanding too, and Training Command was of the opinion that if a pilot could handle the Harvard or Master he would be able to fly a frontline fighter like the Spitfire. (Philip Jarrett)

were expected to fly solo, followed by further dual instruction and night flying. Those capable of handling the Harvard or the Master were then judged able to fly a frontline fighter. To reach that point they had to complete a further 120 hours, including 20 hours of night flying during three-and-a-half months of training. Finally, with 200 hours in their logbooks, the cadets were awarded their wings.

The final step before being assigned to a fighter squadron was the OTU. For those of the pre-war era and veterans of the first few months of World War 2, frontline training was undertaken at squadron level. That meant new pilots were posted to operational units with very little time on their assigned fighter and no tactical training of any sort. While this worked well before the war, combat attrition soon provoked a major change. Because there were no two-seat Spitfires in which to give pilots their first flights, young trainees could only learn about the fighter by familiarising themselves with the controls and then going up for a solo flight. In some cases during the desperate days of the Battle of Britain when Fighter Command was short of pilots, trainees missed out on instruction on Harvards and Masters and went straight on to the Spitfire or Hurricane. This did not happen after the late summer of 1940, however.

Two OTUs had been established by March 1940, and they were equipped with a mixture of Hurricanes and Spitfires. Here, young aviators learned to fly the aircraft they would operate in combat so that by 1941 fighter pilots could expect to start squadron service with a minimum of 270 hours of flight time.

By March 1940, Training Command had formed two OTUs to ensure the proper training of fighter pilots destined for frontline units. They were equipped with a mixture of Hurricanes and Spitfires and staffed by instructors resting after tours with Fighter Command. In the OTUs young aviators would learn to fly the aircraft they would operate in combat, and by 1941 fighter pilots could expect to enter squadron service with a minimum of 270 hours of flight time. This aircraft was assigned to No. 57 OTU in July 1941, AR213 being one of the last Spitfire IAs built for the RAF (it was constructed at the Westland Aircraft works in Yeovil). It is seen here marked up as a ‘bounce’ aircraft, complete with red and white horizontal stripes on its nose. Later passed on to No. 53 OTU, AR213 not only survived the war but also the wholesale scrapping of Spitfires in the late 1940s and is presently kept in airworthy condition at Duxford by Spitfire The One Ltd. (Wojtek Matusiak)

By mid-1941 one of the war's most successful training operations was in full swing. Hundreds of aircrew were being trained in Canada, Australia, South Africa, New Zealand and Rhodesia as part of the British Commonwealth Air Training Plan. The BCATP was truly remarkable and would be responsible for training nearly half the aircrew who served in the RAF, RCAF, RAAF, RNZAF and SAAF.

LUFTWAFFE PILOT TRAINING

Before the official creation of the Luftwaffe, all air activity in Germany had been geared towards training because of the ban on military flying under the terms of the 1919 Treaty of Versailles. Those quasi-military aviation organisations formed in Germany during the late 1920s and early 1930s functioned under the cover of civilian activities. Although this stalled the development of both combat aircraft and tactics, the focus on flying training provided the newly created Luftwaffe with plenty of military-trained aircrew. Men came from Lufthansa, gliding clubs and, until 1936, the army. However, the army was also expanding rapidly, and senior officers forbade the Luftwaffe from recruiting from within the Wehrmacht. Conscripts and volunteers would make up the numbers from then on.

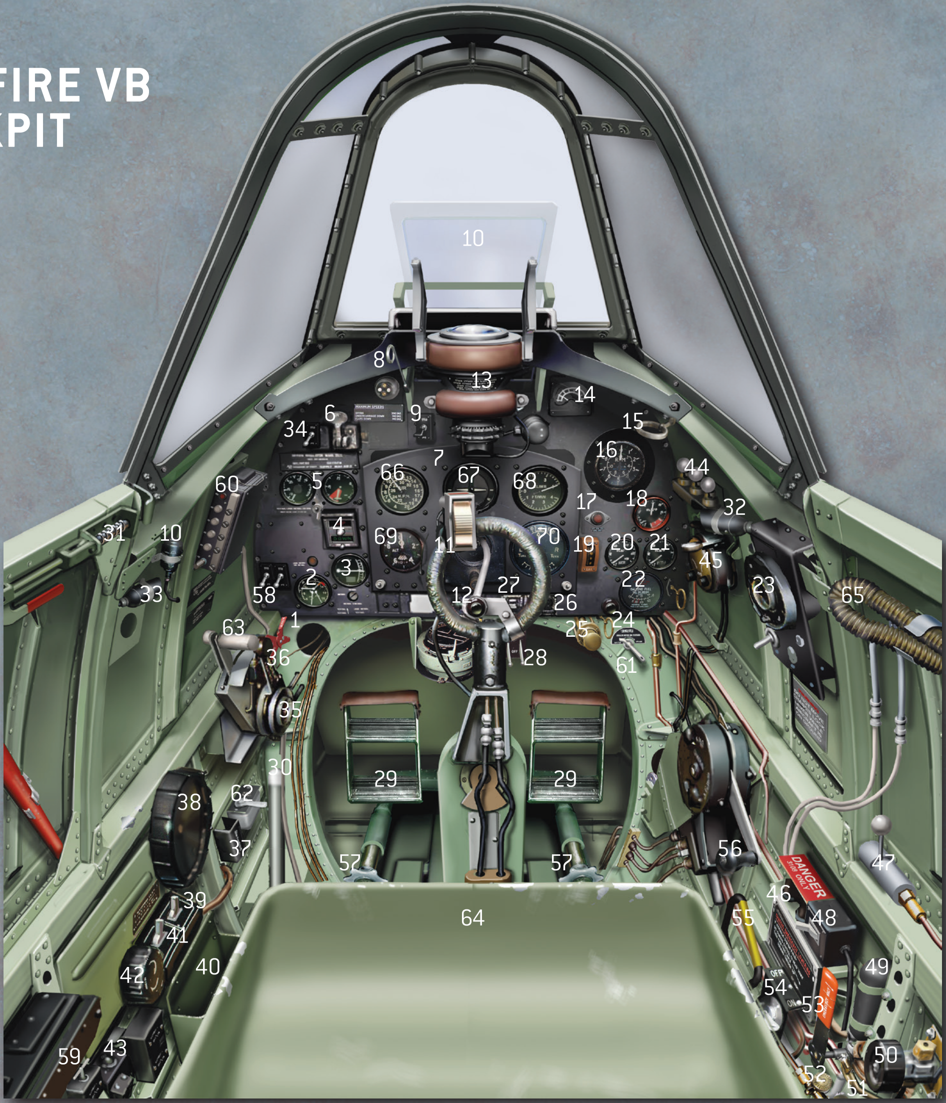
In Germany, pilot recruitment and training was strongly influenced by Prussian military tradition. Initially, all future officers and NCOs could expect to undertake six months of labour service, organised in a paramilitary fashion with the *Reichsarbeitdienst*. Those who were particularly air-minded chose service with the Party-controlled *Nationalsozialistisches Fliegerkorps* instead and flew gliders. But with the Luftwaffe desperately short of personnel, labour service was reduced to just three months.

Induction into the Luftwaffe then followed, after which all recruits spent between six and 12 months undertaking basic infantry training at a *Flieger-Ersatzabteilung*. Once deemed to be an effective infantryman, all recruits were reviewed for possible advancement as pilots. Likely candidates were sent to a *Flug-Anwärterkompanie* (aircrew candidate company) for evaluation in a series of tests in basic aviation theory.

Veteran *Jagdflieger* flying Bf 109Fs in 1941–42 would have taken the full Luftwaffe training course. However, from late 1940 onwards, with the growing demand for pilots following the outbreak of World War 2, training and recruiting staff rationalised and compressed the initial stages of aircrew selection. This enabled trainees to start the most appropriate training regime without delay. The *Flieger-Ersatzabteilung* was now replaced by a series of *Flieger-Ausbildungsregiments*, where recruits would receive basic military training and preliminary aviation instruction. Potential pilots were then sent for the standard selection process within a *Flug-Anwärterkompanie*,

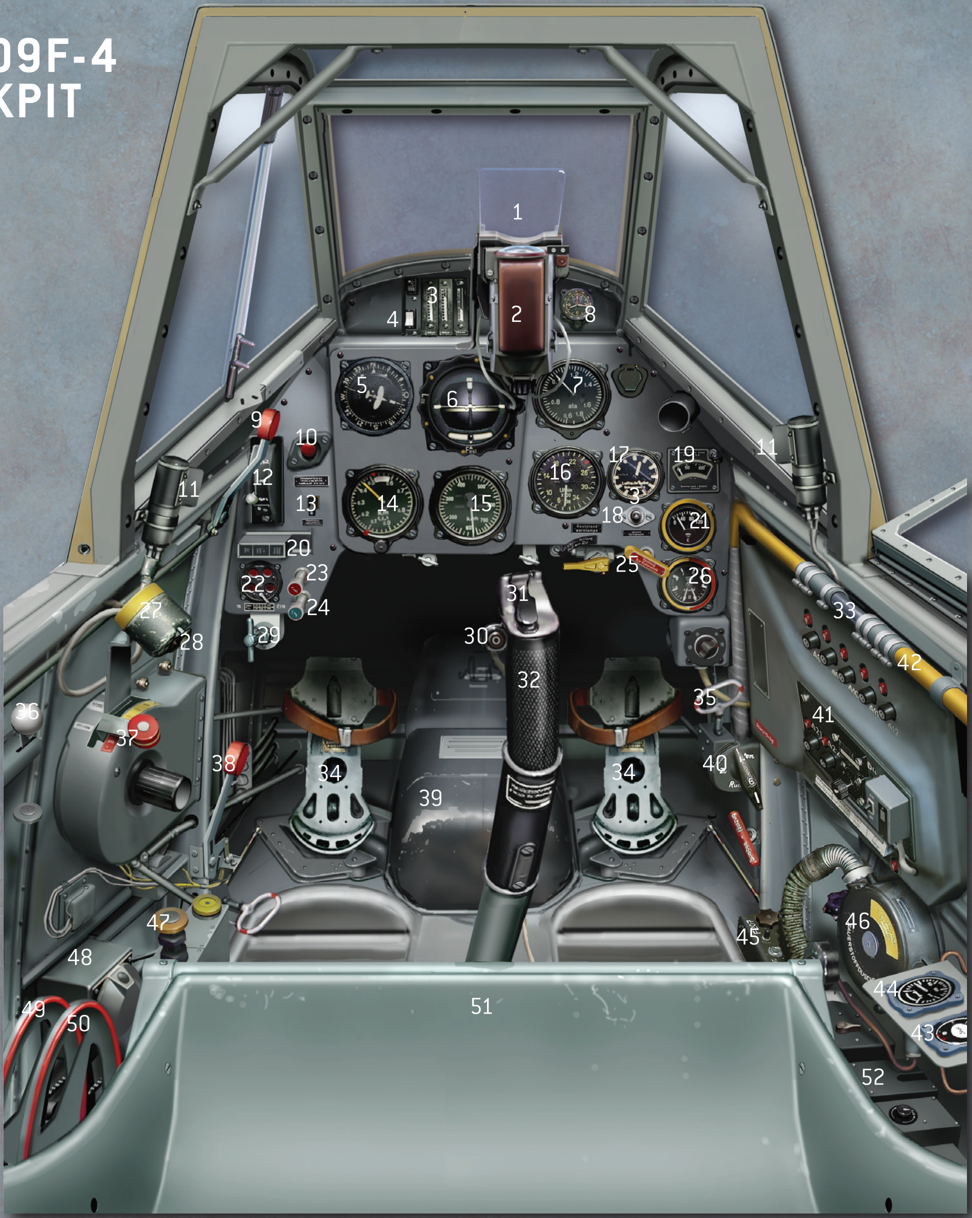
Flugzeugführer-Anwärter (pilot candidate) Hans Ille, who later flew with JG 26 on the Channel Front, poses with an Fw 44 at an unidentified Luftwaffe training airfield. Known as the Stieglitz ('Goldfinch'), the Fw 44 was produced by Focke-Wulf as a pilot training and sport flying aircraft from 1932. (EN-Archive)

SPITFIRE VB COCKPIT

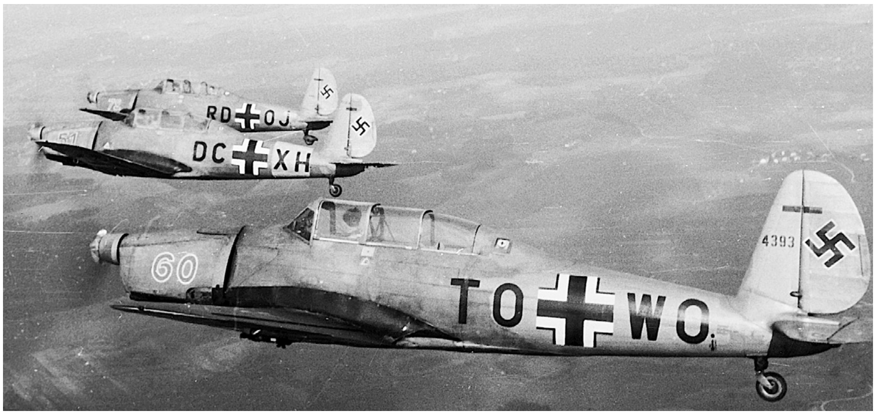


1. Boost control cut-out
2. Brake triple pressure gauge
3. Elevator tabs position indicator
4. Undercarriage position indicator
5. Oxygen regulator
6. Flaps control
7. Blind flying instrument panel
8. Lifting ring for sunscreen
9. Reflector gunsight switch
10. Sunscreen
11. Gun and cannon three-position push button
12. Camera-gun push button (for activation)
13. Barr and Stroud GM 2 reflector gunsight
14. Voltmeter
15. Ventilator control
16. Tachometer
17. Fuel pressure warning lamp
18. Boost pressure gauge
19. Oil pressure gauge
20. Oil temperature gauge
21. Radiator temperature gauge
22. Fuel contents gauge and push button
23. Remote contactor and contactor switch
24. Slow-running cut-out
25. Engine priming pump
26. Engine starting push button
27. Booster coil push button
28. Fuel cock control
29. Rudder pedals
30. Radiator flap control lever
31. Two-position door catch
32. Cockpit floodlight
33. Camera indicator supply plug
34. Navigation lights switch
35. Control friction adjusters
36. Propeller speed control lever
37. Radio control plug storage
38. Elevator trimming tab hand-wheel
39. Camera-gun switch
40. Map case
41. Pressure head heater switch
42. Rudder trimming tab hand-wheel
43. Oil dilution push button
44. Stowage for reflector gunsight lamps
45. Signalling switchbox
46. R.3002 Identification Friend or Foe (IFF) master push buttons
47. Harness release control
48. R.3002 IFF master switch
49. CO_2 cylinder for emergency lowering of undercarriage
50. Oxygen supply cock
51. Windscreen de-icing pump
52. Windscreen de-icing needle valve
53. Undercarriage emergency lowering control
54. Windscreen de-icing cock
55. External fuel tank jettison lever
56. Undercarriage control unit lever
57. Rudder pedal adjusting star-wheels
58. Ignition switches
59. Signal discharger control
60. T.R. 1196 or T.R. 1304 transmitter and receiver controls
61. Fuel tank pressurising cock control
62. Air intake control
63. Throttle control
64. Seat
65. Oxygen hose
66. Airspeed indicator
67. Artificial horizon
68. Rate-of-climb indicator
69. Altimeter
70. Turn-and-slip indicator

Bf 109F-4
COCKPIT



1. Revi C12D reflector gunsight
2. Gunsight pad
3. Ammunition counters
4. Armament switch
5. Repeater compass
6. Artificial horizon/turn-and-bank indicator
7. Manifold pressure gauge
8. Clock
9. Canopy jettison lever
10. Main light switch
11. Instrument panel lights
12. Ignition switch
13. Start plug cleansing switch
14. Altimeter
15. Airspeed indicator
16. Tachometer
17. Propeller pitch position indicator
18. Fuel warning lamp
19. Combined coolant exit and oil intake temperature indicator
20. Starter switch
21. Fuel gauge
22. Undercarriage position indicator
23. Undercarriage retraction switch
24. Undercarriage extension switch
25. Undercarriage emergency release lever
26. Oil and fuel contents gauge
27. Throttle
28. Propeller pitch control
29. Dust filter handgrip
30. Bomb release button
31. Gun firing trigger
32. Control column with KG 12A grip
33. Drop tank flow control tube
34. Rudder pedals
35. Radiator cut-off handle
36. Ventilation control lever
37. Oil cooler flap control
38. Fuel cock lever
39. MG 151/20 cannon breech cover
40. Radiator shutter control lever
41. FuG 16ZY radio control panel
42. Drop tank pipe
43. Oxygen supply indicator
44. Oxygen pressure gauge
45. Radio controls
46. Oxygen supply
47. Fuel injection primer pump
48. Tailplane incidence indicator
49. Undercarriage emergency lowering hand-wheel
50. Tailplane trim adjustment wheel
51. Seat
52. Radio tuner panel



Cadets practise formation flying in Arado Ar 96B-2 trainers. Used for advanced, night and instrument flying training, the Ar 96 was a single-engine, low-wing monoplane of all-metal construction. All three student pilots are flying solo, which would indicate that they are nearing the end of their training. (EN-Archive)

where the rest of their basic training, conducted over a period of three to four months, was completed alongside the aircrew evaluation tests.

On assignment to a *Flug-Anwärterkompanie*, the *Flugzeugführer-Anwärter* (pilot candidate) received instruction in basic flight theory and rudimentary aeronautics in aircraft such as the Bü 131, Ar 66C, He 72 Kaddett, Go 145 and Fw 44 Stieglitz biplane trainers. Assessed for advancement throughout this phase, those candidates displaying the required aptitude were then sent to *Flugzeugführerschule A/B* as soon as a space became available – typically two months after arrival at the *Flug-Anwärterkompanie.* Here, flight training proper would be undertaken.

At these schools students underwent four principal levels of instruction, each requiring qualification for its own licence, before advancement to the next stage. These licences, earned over a period of six to nine months, gave the schools their name. The *A1-Schien* introduced students to basic practical flying in dual-controlled training aircraft, instructors teaching recruits how to takeoff and land, recover from stalls and attain their solo flight rating. Before the war and up to early 1941, each instructor was assigned four trainees, a number which rose as the conflict progressed.

At the *A2-Schien*, cadets were required to learn the theory of flight, including aerodynamics, meteorology, flying procedures and aviation law, as well as the practical application of aeronautical engineering, elementary navigation, wireless procedure and Morse code. In the air, they gained more flying experience on larger single-engined two-seat aircraft.

The next level of training, known as the *B1-Schien*, saw pilots progress to high-performance single- and twin-engined machines typically fitted with a retractable undercarriage. Pilots selected to fly fighters were assigned to train on older types of combat aircraft such as early Bf 109s. Precision landings, night flying and landings, and cross-country flying were all tested in this phase. Student pilots also had to complete at least 50 flights in a B1 category aircraft. On graduation from the *B1-Schien*, having accumulated 100 to 150 hours of flight time over the previous 14 to 17 months, students then undertook training aimed at acquiring the final *B2-Schien*.

In late 1940 the *Flugzeugführerschule A/B* was streamlined to take into account wartime demand for pilots. From the outset far greater emphasis was now being placed on practical flying skills. The A2 licence was dropped, with that phase being amalgamated into the remaining grades.

This veteran Bf 109B was flown by student pilots undertaking their *B1/2-Schien* training at *Jagdfliegervorschulen* or *Waffenschule* in 1940–41. Over a three- to four-month period aviators accumulated 50 hours of flying on semi-obsolescent types. For future Bf 109F pilots this usually meant Ar 68 and He 51 biplanes, Bf 109B/C/D/Es and Ar 96s. (EN-Archive)

The A-licence generally took three months to complete, with pilots flying more advanced types during the B phase. An elementary K1 *Kunstflug* (stunt-flying) aerobatics course was also included in the latter phase to provide pilots with a good understanding of rudimentary evasive manoeuvres like barrel rolls, loops and formation splits. This phase also allowed instructors to identify potential fighter pilots, who then received more flying time than their fellow students.

On completion of the B2 phase cadets were finally granted their *Luftwaffeflugzeugführerschein* (air force pilots' licence), accompanied by the highly prized *Flugzeugführerabzeichen* (pilot's badge) – their 'wings'. After an average of ten to 13 months at *Flugzeugführerschule A/B*, they were now fully qualified as pilots.

It was at this point that they were categorized for service on single- or multi-engined aircraft, with each being assigned to a specialist flying school. Here, they underwent intensive training for their allotted aircraft type. Potential fighter pilots were sent directly to *Jagdfliegervorschulen* or *Waffenschule* for three to four months for 50 hours of flying on semi-obsolescent types. For Bf 109F pilots this usually meant Ar 68 and He 51 biplanes, Bf 109B/C/D/Es and Ar 96s. By the time they were eventually posted to frontline units, pilots could expect to have logged 200 hours of flying time. On reaching the *Jagdgeschwader*, a tyro fighter pilot initially served with its *Schulstaffeln* to gain further experience. By then, officer candidates had also attended *Luftkriegschule* to learn tactics, air force law and military discipline, before assignment to a *Jagdfliegervorschulen*.

The realities of war led the Luftwaffe to further modify the final stages of its training syllabus for fighter pilots in early 1940. Individual *Schulstaffeln* were replaced by the single *Ergänzungsjagdgruppe* (Operational Fighter Training Group) *Merseburg* for instruction in tactics and further familiarisation with frontline types. It was hoped that its creation would free *Jagdgeschwader* to operate more efficiently in the frontline. In reality, *Ergänzungsjagdgruppe Merseburg* was found to be too large to operate effectively and too remote from the frontline to allow pupils to be briefed on current combat techniques, as the *Jagdgeschwader* were complaining that the replacement pilots they were receiving had little chance of achieving success on the Channel Front. In an effort to rectify this, the Luftwaffe decided to disband the *Ergänzungsjagdgruppe* in October 1940 and enlarge and reassign its *Staffeln* to each operational *Jagdgeschwader* once again.

JAMES RANKIN

With ten Bf 109Fs and seven Bf 109Es claimed as destroyed, 'Jamie' Rankin was one of the most successful Spitfire V pilots of the Channel Front campaign. Rankin was born in Portobello, Edinburgh, on 7 May 1913. He joined the RAF in 1935 and received a commission. On completing his flying training with No. 2 Flying Training School he joined Fury II-equipped No. 25 Sqn. Following a spell with the Fleet Air Arm's 825 Naval Air Squadron, flying Fairey IIIFs from HMS *Glorious*, Rankin became an instructor with No. 5 OTU. In early 1941 he was promoted to squadron leader and attached to No. 64 Sqn to gain operational experience flying Spitfire IIAs. He claimed a shared victory and two probables during his brief time with the unit.

In February of that year Rankin took command of No. 92 Sqn just as it was re-equipping with the first Spitfire Vs to reach Fighter Command. His score mounted rapidly as he led the unit on fighter sweeps and bomber escort missions over northern France. In June Rankin received the DFC after he had claimed nine victories (all bar one of them being over Bf 109s). In September he was promoted to wing commander and became Biggin Hill Wing Leader. Sgt Walter 'Johnnie' Johnston of No. 92 Sqn served with Rankin during 1941–42 and he recalled his leadership qualities in Peter Caygill's volume *Spitfire Mark V in Action*:

> When 'Jamie' took over as Wing Leader things did change a little bit. Malan [Wg Cdr Adolf 'Sailor' Malan, Rankin's predecessor and a high-scoring ace] was a very hard taskmaster. He expected that everybody who he picked to put into a job could do it, and if they couldn't, he got rid of them. He was an excellent tactician, but he was quite ruthless and had a bit of a reputation for losing his No. 2s. Quite often he would take evasive action without any warning and the No. 2 was left high and dry, miles behind, which was why some of us used to find ourselves stuck on our own at times.
>
> 'Jamie' was different. He had been a good CO, but he freely admitted that he was learning, the same as everybody else, because 92 was his first operational trip after time as an instructor. As far as gunnery was concerned he was damn good, but the thing that impressed me most was his flying, which was absolutely immaculate. If you were supposed to be going into a turn of 110 degrees, you did 110, not 105 or 115, but 110 exactly, so personally, I found life easier with him as Wing Leader.

Sqn Ldr 'Jamie' Rankin in 1941, when CO of No. 92 Sqn. (Andrew Thomas)

Between December 1941 and April 1942 Rankin held a staff post at HQ Fighter Command, before returning to Biggin Hill for a second tour leading the wing. In 1943 he commanded No. 15 Fighter Wing in the newly formed 2nd Tactical Air Force and when that unit was disbanded he assumed command of No. 125 Wing, which he led during the Normandy invasion. Promoted to air commodore by war's end, Rankin reverted to group captain rank post-war. Having been Air Attache in Dublin in 1948 and OC RAF Duxford in 1954, he eventually retired from the RAF in 1958. 'Jamie' Rankin passed away in 1975. During his service on the Channel Front he had claimed 17 and five shared aircraft destroyed, three and two shared probably destroyed, 16 and three shared damaged and one destroyed on the water.

WERNER MÖLDERS

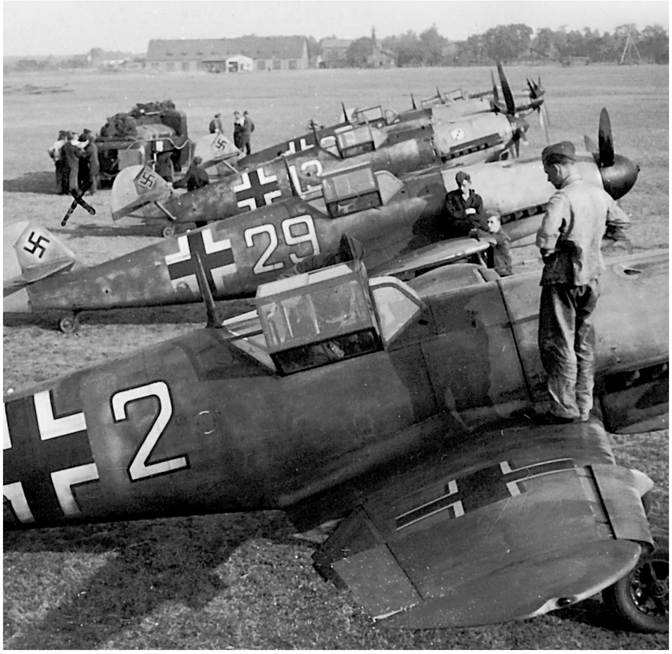
The leading German ace of the Spanish Civil War, Werner Mölders was instrumental in the development of the new fighter tactics so effectively employed by the Luftwaffe in World War 2. Born on 18 March 1913 in Gelsenkirchen, he was the third of four children. Like his father, who had been killed in action in March 1915, Mölders joined the infantry in April 1931 before transferring to the fledgling Luftwaffe in early 1934. Despite initially suffering from chronic airsickness, he successfully completed the early stages of his flying training and was posted to a *Jagdfliegervorschulen*.

Mölders was sent to I./JG 162 in July 1935, became leader of the training squadron within II./JG 134 in April of the following year and was promoted to *Staffelkäpitan* of 1./JG 334 in March 1937. In early 1938 he volunteered for service with the *Legion Condor*, which had been formed by the Luftwaffe to assist the Nationalists in their civil war with the Republicans in Spain. Mölders arrived in April 1938 and was assigned to the 3rd squadron of *Jagdgruppe* 88, which was then equipped with Heinkel He 51 biplanes. He replaced Oberleutnant Adolf Galland as CO of 3./JG 88 in late May 1938 upon the latter's return to Germany, the unit having by then received Bf 109B-2s. Whilst in Spain, Mölders and other German airmen developed the formation known as the 'finger-four', which improved the all-round field of vision and combat flexibility of the standard Luftwaffe *Schwarm*. Encouraging pilot initiative through enhanced mutual protection, the 'finger-four' comprised two elements (*Rotten*) whose positions mirrored the fingertips of an outstretched hand. Between 15 July and 3 November 1938 Mölders used these tactics to great effect, downing 15 enemy aircraft, although he was credited with only 14 victories, to become the leading ace of the *Legion Condor*.

Returning to Germany in December 1938, he served concurrently with both I./JG 133 and the *Reichsluftfahrtministerium*, devising new fighter tactics with the latter organisation based on his experiences in Spain. In March 1939 Mölders was made *Staffelkapitän* of 1./JG 133. This *Jagdgeschwader* later became JG 53 and he claimed his first victory with the unit on 20 September 1939 when he downed a French Hawk H-75A. Mölders had taken his tally to 38 victories (and received the Knight's Cross) by the time he was himself shot down and captured during the Battle of France on 5 June 1940. Released after the French capitulation, he was posted to JG 51 as its *Kommodore* the following month and remained in the vanguard of the action with the *Geschwader* throughout the Battle of Britain. During the latter stages of the conflict Mölders gave the Bf 109F its combat debut, claiming the first of at least 22 victories in the 'Friedrich' on 11 October 1940.

Oberst Werner Mölders in 1941, when *Kommodore* of JG 51. (Bundesarchiv, Bild 146-1971-116-29)

In the early summer of 1941, having taken his score to 76, Mölders led JG 51 east in preparation for the invasion of the USSR. Like most Jagdwaffe pilots involved in the massive Eastern Front offensive, codenamed Operation *Barbarossa*, he enjoyed astonishing success in his Bf 109F. Indeed, between 22 June and 15 July, Mölders' tally rose to 108 victories. By then he had added the Oak Leaves, Swords and Diamonds to his Knight's Cross. Posted away from the frontline to become Inspector General of Fighters, he was killed in a flying accident on 22 November 1941 while travelling to the funeral of his superior officer, World War 1 ace Generaloberst Ernst Udet.



A line-up of Bf 109Es and Fs of IV./*Ergänzungsgruppe* JG 3 at Monchy-Breton during the late spring of 1941. By then the *Jagdgeschwader* had enough F-2s on strength to pass a few to its *Stab*, 1. *Einsatzstaffel* (Operational Training Squadron) and 2. *Schulstaffel* (Training Squadron), although the bulk of the aircraft flown by the tyro fighter pilots were war-weary 'Emils'. JG 3 headed east for Operation *Barbarossa* shortly after this photograph was taken. (EN-Archive)

The increase in demand for pilots, combined with the high attrition rate during the summer of 1940, eventually resulted in the *Ergänzungsstaffel* being enlarged to *Gruppe* strength and given the designation IV. *Gruppe* within the *Jagdgeschwader* to which it was attached. Each new *Gruppe* comprised a *Stab*, a 1. *Einsatzstaffel* (Operational Training Squadron) and a slightly larger 2. *Schulstaffel* (Training Squadron), which had more aircraft and personnel. The latter were transferred in from the parent *Geschwader*, although each *Ergänzungsgruppe* was controlled directly by the *General der Jagdflieger* to ensure that uniform standards were maintained. The expansion of these units began during the early spring of 1941.

It was the *Schulstaffel*'s job to train new pilots in operational tactics and techniques, with instructors being *Jagdflieger* drawn from the frontline. During their time with the *Schulstaffel*, pilots gained familiarity with the fighters then in service with the *Jagdgeschwader*. Most training units had to make do with combat-weary Bf 109Es for much of 1941 as there were few F-models available to *Schulstaffeln*. Instructors concentrated on teaching the tactics used by standard Jagdwaffe fighter formations, namely the *Rotte* and the *Schwarm*. They were practised in the air over and over again. Low-level flying and aerial gunnery were also taught. Trainee pilots would eventually graduate to the *Einsatzstaffel*, where they would gain combat experience in quieter parts of the Channel Front.

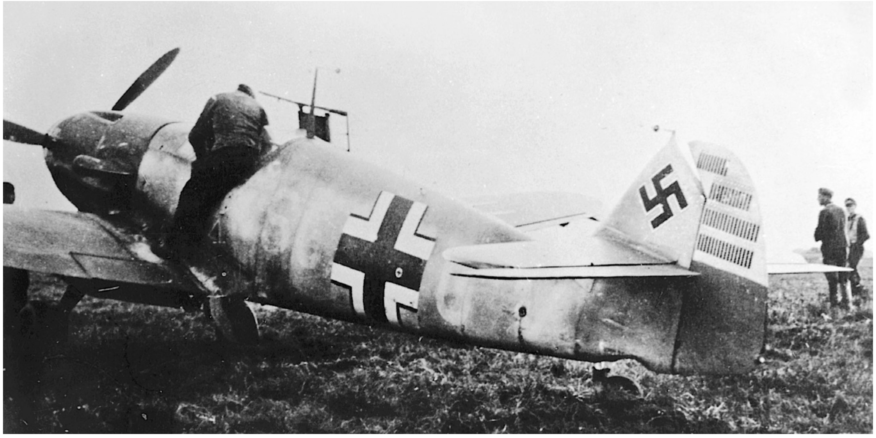
The conversion course was meant to last eight to 12 weeks but the demand for pilots in the frontline often meant that trainees were frequently rushed into service after a few weeks with the *Schulstaffel* and the *Einsatzstaffel*. And although instructors with recent combat experience could directly pass their knowledge to new pilots in a timely fashion thanks to the creation of the *Ergänzungsgruppen*, these same individuals were also urgently needed in the *Jagdgeschwader* too. Eventually, frontline commitments carried the day to the detriment of the student pilots.

Although the *Ergänzungsgruppen* experiment had initially worked well enough initially, it was found that the methods and quality of training within the various *Staffeln* and *Gruppen* varied due to a growing lack of qualified instructors. This meant that the conversion course for students was getting progressively shorter. In the summer of 1942, just as the last Bf 109Fs were being replaced on the Channel Front, the *Ergänzungsgruppen* attached to specific units were disbanded and three *Ergänzungsjagdgruppen* were formed in their place. These Fighter Pools were situated in the three main operational areas, with replacement pilots for the Channel Front coming from *Ergänzungsjagdgruppen Süd* (south) at Cazeaux, in France. Although this new arrangement reduced the number of instructors required, it also curtailed the operational training of new pilots just when such experience was becoming vitally important for replacement frontline aviators.

COMBAT

Spitfire II/Vs and Bf 109Fs were engaged in aerial combat from the autumn of 1940 to the late summer of 1942. Yet for almost 12 months after the F-model had made its frontline debut, its slow delivery meant that German fighter units in the West continued to employ late-build Bf 109E-7/8s. Similarly, the last of the Spitfire IIs on the Channel Front had been replaced by the end of 1941, leaving the Spitfire V as Fighter Command's principal type until the first Mk IXs started appearing in July 1942. By then, the only 'Friedrichs' still in service with JG 2 and JG 26 were the relative handful of Bf 109F-4/B *Jabos,* most of the fighter *Gruppen* from both units having switched to the superior Fw 190A.

The early F-models were powered by the same DB 601N engine as the Bf 109E-7/8 to give them a similar performance, although the refined aerodynamics of the 'Friedrich'



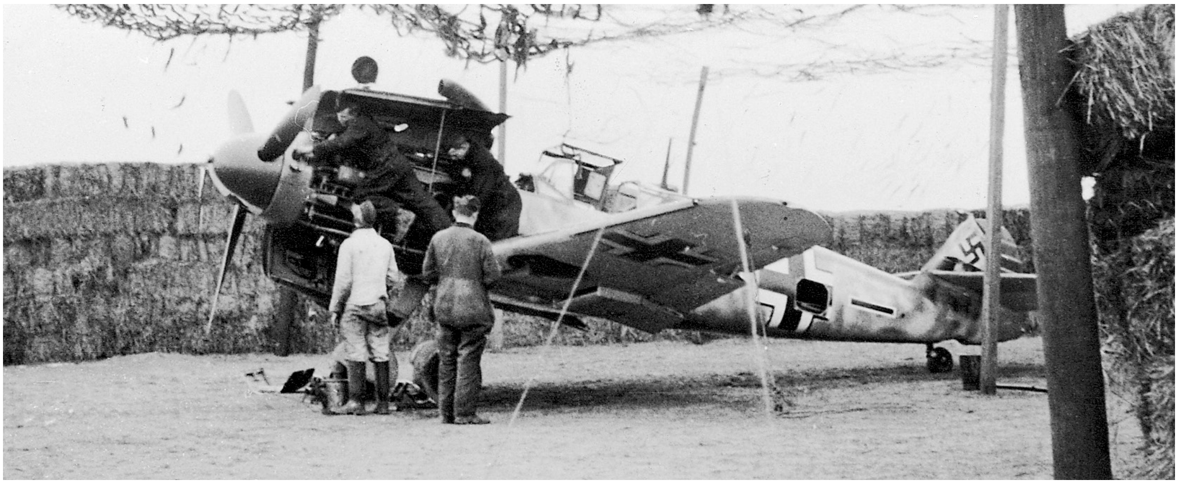
The first Bf 109Fs to reach the Channel Front were three F-1s issued to *Stab.* JG 51 in October 1940. Displaying 54 victory bars on its rudder and still bearing traces of its original four-letter delivery code (SG+GW) on the fuselage – but with no command markings yet applied – Wk-Nr 5628 was assigned to Major Werner Mölders. It is seen here at St Omer several weeks after it had made the F-model's combat debut. The lower half of the rudder and its entire engine cowling were painted yellow. (John Weal) meant the new fighter was superior at higher altitudes. Major Werner Mölders, *Kommodore* of JG 51, proved this during October 1940 when the *Jagdgeschwader*'s *Stabsschwarm* was issued with three early-build Bf 109F-1s. JG 51 was the most active German fighter unit on the Channel Front at the time, with Mölders its most successful pilot. Indeed, in October he claimed 12 of the *Stab*'s 13 victories – over nine Hurricanes and three Spitfires, achieved while escorting high-flying JG 51 *Jabos* or during fighter-only 'Freie Jagd' sweeps. Although most of Mölders' claims that month involved Hurricane Is and Spitfire Is, he also downed two Spitfire IIAs and badly damaged a third during a brief encounter on the morning of 25 October. This was almost certainly the first time the Bf 109F had fought the latest version of the Vickers Supermarine fighter.

No. 603 Sqn was the RAF's most successful Battle of Britain unit in terms of enemy aircraft destroyed, and on the 25th it had scrambled 12 of its recently-delivered Spitfire IIAs from Hornchurch after high-flying German aircraft were detected approaching London. It was the first raid of the day and comprised three waves of aircraft arriving in a steady stream between 0845 and 1030 hrs. Of an estimated 140 Luftwaffe aircraft detected over southeast England, ten to 12 were Do 17 bombers in the first wave, while the rest were Bf 109s. Most were engaged over Kent, although some reached London, where they dropped their bombs.

As the No. 603 Sqn aircraft desperately climbed through thick cloud to get above the approaching German formations they made full use of the extra 18lb of boost introduced with the Merlin XIII engine. But their pilots were alarmed to hear over their radios that the fighter controller vectoring the unit towards the enemy had been informed by radar plotters that there were already Bf 109s in their immediate vicinity. Moments later they received a second warning: enemy fighters were almost on top of them. As the 12 Spitfires finally broke through the overcast into clear blue skies at 25,000ft, they were bounced by a gaggle of Bf 109E/Fs from *Stab.* JG 51. They had been heading northwest at 30,000ft, taking advantage of their superior high-altitude performance. Leading the formation was Major Mölders, looking for his 63rd victory.

No. 603 Sqn immediately broke formation. Some pilots were simply fighting to survive while others pursued the rapidly disappearing Bf 109s. The aim of the Luftwaffe's leading ace had been good during JG 51's solitary pass. Mölders targeted the last vic of three Spitfire IIAs, flown by Plt Offs Peter Olver, John Soden and Ludwik Martel. Olver and Soden were both forced to bail out of their mortally damaged Spitfires over the Sussex-Kent border, having just become Mölders' 63rd and 64th victims. Martel's P7350 had sustained damage to its left wing when a cannon shell passed through it. The Pole also heard banging noises behind him and then felt a sharp pain in the left side of his body and leg.

Diving back into cloud to shake off his unseen assailant, Martel then checked his wounds. There was little blood but his leather flying jacket had been torn and he realised he had been hit in the left leg by shrapnel when the cannon shell exploded. Now he would have to nurse his badly damaged Spitfire back through the thick cloud cover. Martel struggled to concentrate on his cockpit instruments as he descended. 'I lost consciousness', he recalled many years later, 'and when I came to I realised I was below the cloud upside down. There was a large hole in the left wing and my engine was not working.' Righting his aircraft just above the ground, Martel force-landed in a grassy field near Hastings, in East Sussex. He reported:



Parked in a somewhat superficially camouflaged blast pen made out of bales of straw at Mardyck in May 1941, this F-2 was one of a pair of 'Freidrichs' assigned to Oberstleutnant Werner Mölders of JG 51 at the time and adorned with his victory tally. The Luftwaffe's ranking ace for much of 1941, Mölders claimed nine Spitfires and five Hurricanes in these F-2s between 20 February and 8 May 1941. (John Weal)

> When I looked out of the cockpit I saw a windmill. I had not seen one since arriving in England, and I knew that there were plenty of them in Holland. I now began to wonder if, while I was unconscious, I had flown across the North Sea. I feared that I would be taken prisoner by German soldiers, but none came. Soon, a Home Guard patrol arrived – old grandpas, or so they seemed to me – but I was unable to communicate with them. Although I now knew that I was safely in England, the Home Guard thought that I was a German! Finally, an officer appeared and I was correctly identified as a pilot in the RAF. My wounds were dressed and I was taken to a hospital. I must have been suffering from a fever by then for I threatened to shoot a German flyer who had been admitted at the same time as me.

After ten days' recuperation, Martel returned to operations with No. 603 Sqn on 6 November. P7350 was also repaired and sent back into the frontline.

It would appear that No. 603 Sqn was also the first Spitfire IIA unit to down a Bf 109F when, shortly after noon on 11 November, its pilots claimed three Messerschmitt fighters destroyed and one probable (together with a Ju 87 probable) without loss ten miles north of Margate. Twelve of the unit's aircraft were flying a convoy protection patrol over the Thames estuary at an altitude of 20,000ft when they spotted Ju 87s and an escort of Bf 109s approaching from the northwest. The ensuing one-sided action was described by Major Fritz von Forrell in his 1941 volume *Mölders und seine Männer* (*Mölders and his Men*):

> 11 November proved one of the blackest days in Oberstleutnant Mölders' career. For weeks, owing to a bad case of flu, he had had to stay out of the cockpit of his Messerschmitt. Finally, he felt fit enough to direct his fighters from the ground control room. In the meantime, the best of his boys, Oberleutnant Georg Claus [who had 11 victories to his name, including a trio of Hurricanes claimed in a Bf 109F three days earlier], took command of the first *Staffel*. Despite adverse weather conditions in November, the *Geschwader* flew many tough escort missions for the benefit of bomber units. Claus excelled in his new post, proving that, even without his tutor around [he had often flown as Mölders' wingman], he was a capable *Kapitän* and an excellent fighter pilot.

> On that fateful day the *Geschwader* again took to the air to shepherd the dive-bombers to their target at the mouth of the Thames river. Banks of thick cloud hung low over the Channel and intermittent rain squalls limited the already poor visibility even more. Finally, the bomber formation located its target, a coastal convoy. A burst of excited R/T betrayed a fight breaking out in the air. Someone declared a victory, then someone else feverishly shouted a warning. The intense radio traffic suggested that the skirmish was particularly heavy. Then … what happened? One of the pilots reported he was hit. Moments later another report followed – a ditching in the Channel!
>
> Mölders anxiously left the ground control room and walked out towards the landing ground. The first of the returning machines, rocking its wings, came into sight. This was Oberleutnant Friedrich Eberle, who was announcing his victory over a Spitfire [two Hurricanes from No. 17 Sqn were in fact downed, but no Spitfires] in the usual Luftwaffe manner. As soon as he clambered out of the cockpit he reported with a shaken voice that Oberleutnant Claus had ditched in the Thames estuary because of a coolant leak from his shot-up radiator. Mölders listened no longer. He rushed to a telephone. For the first time Mölders' men saw their *Kommodore*, known for his nerves of steel, look apprehensive. With his hand trembling, he gripped the receiver, instructing the air-sea rescue service. He immediately ordered the groundcrew to ready an aircraft for him – and, accompanied by Oberleutnant Eberle, took to the air for the first time in two weeks to search for the man who was closer to him than any other pilot in his *Geschwader*.
>
> The two Messerschmitts skimmed the land beneath them, going flat out towards the murky waters of the English Channel. They flashed past the Cape of Margate and approached the Thames estuary. Mölders seemed unconcerned about six Spitfires still circling above the convoy. He kept on looking around, scanning ever-larger areas of empty sea. He stayed over the spot until his Bf 109 had no more fuel to remain, straining his excellent eyesight in the hope of picking up a trace of the missing man against the dark surface of the water. Finally, with a heavy heart, he returned to base. This loss was a personally disheartening blow to him. They were friends and comrades in combat, for good and for bad. So many times they had fought side by side, protecting each other.

No trace of Claus's body was ever found.

Production delays with the 'Friedrich' slowed conversion to the new fighter during the first half of 1941. This, in turn, meant that Bf 109Fs clashed with Spitfire IIs and, from February onwards, Vs, albeit infrequently until the summer of that year. *Jagdgeschwader* would send individual *Gruppe* back to Germany to re-equip with the Bf 109F-1/2, starting with *Stab.* and I./JG 51 in February, followed by III. and IV./JG 51. Like all units 'converting' to the 'Friedrich' at this time, these units returned to France predominantly equipped with Bf 109E-7/8s. In March a small number of F-models were issued to *Stab.* and I./JG 3, *Stab.* and III./JG 26 and *Stab.*, I., II. and III./JG 53.

By then the first Spitfire VBs had reached No. 92 Sqn at Manston, these aircraft in fact being re-engined Spitfire IBs fitted with the new Merlin 45. As with the Bf 109F, production of the new Mk V was initially a slow affair, leaving the Spitfire I/IIA and Hurricane I/II units that predominated in Fighter Command to undertake the early offensive missions over France. The first 'Circus', flown on 10 January 1941, had seen six Blenheim IVs target an airfield and an ammunition dump a few miles inland from

Calais. Six Spitfire and three Hurricane units were tasked with escorting the bombers, which they successfully shielded from sporadic attacks by Bf 109s. The latter were E-models from I./JG 3 and 2(J)./LG 2. It would appear that the first RAF fighters engaged by Bf 109Fs (of I./JG 51) during 'Circus' operations were probably Hurricane Is or IIs, which were initially involved as bomber escorts.

With partially re-equipped *Jagdgeschwader* returning to the Channel Front throughout March, the number of F-models in France began to rise. After spending a few days re-acclimatising to operations in the frontline, 'Channel work' began in earnest. But conditions had changed since the previous autumn. Now there were few escort missions for bombers heading for England. 'Freie Jagd' sweeps over Kent and Sussex were also rare. Instead, most missions now took the form of defensive patrols off the French coast as well as interceptions of the incoming RAF fighters and bombers that were attacking targets in occupied France with increasing frequency.

One of the units that was heavily involved in the early cross-Channel operations from Manston and Biggin Hill was No. 92 Sqn. Among the fighters it flew on these sorties over the Continent was R6923/QJ-S, which was built as a rare cannon-armed Mk IB and delivered to No. 19 Sqn in July 1940. The fighter was relegated to No. 7 OTU when persistent jamming of its two 20mm weapons saw all Mk IBs swapped by No. 19 Sqn for standard Spitfire IIAs. Converted into a Spitfire VB in April 1941, the aircraft was then issued to No. 92 Sqn and regularly flown by ace Flg Off Alan Wright. He made several claims in R6923 prior to the aircraft being shot down by Bf 109s (possibly from JG 26) over the Channel on 21 June 1941 during 'Circus 16'. Its pilot, Sgt G. W. Ashton, bailed out and was rescued. (Philip Jarrett)

IV./JG 51 enjoyed one of its best days with the Bf 109F on 5 March when its pilots intercepted 12 Spitfire IIAs of No. 610 Sqn that were supposed to be providing high cover for six Blenheim IVs targeting Boulogne in 'Circus No. 7'. Four Spitfires were downed in short order, resulting in the deaths of two pilots and two more being captured. These losses alarmed AVM Leigh-Mallory, who described the action in the following report:

> Fighter Sweep to Boulogne 5 March 1941
> Three Spitfire squadrons (610, 616 and 145) were ordered to leave the ground at 1230 hours and rendezvous over Hastings at 1300 hrs. 610 Squadron (leader, F/L Norris DFC) led the formation and was told to fly at 25,000ft, with 616 at 26,000 and 145 at 30,000. The formation circled Hastings at the right time and at the proper heights but failed to find the bomber formation or its escort fighters. After circling for about 20 minutes, leader asked Controller for instructions and said he was unable to contact 'friends'. Controller took 'friends' to mean other two squadrons i.e.: 616 and 145, whereas, of course, the leader meant the bomber formation.
>
> At about 1330 hrs (by which time the formation had been in the air for an hour), Control vectored its three squadrons on 100 degrees which took them out to sea towards Boulogne. About mid-Channel, leader was told by Controller that bandits were approaching from southeast in his vicinity. Immediately afterwards leader sighted 4 Me109s (yellow noses) which attacked from about 500ft higher, apparently with great determination. A dogfight ensued and the whole squadron (610) broke up and eventually eight pilots returned to their base singly, landing between 1410 and 1430 hrs. Neither the leader nor anyone else know what happened to the 4 missing pilots, who were inexperienced, and the only information I was able to obtain was that one of the

92 EAST INDIA SQUADRON
92 EAST INDIA SQUADRON
DESTROYED ~~129~~ 130
PROBABLE 60
DAMAGED 70
TOTAL 259

Aces abound in this shot of No. 92 Sqn at Manston on 6 February 1941 as the unit was making the transition from Spitfire Is to Vs. The pilots with five or more victories are Sgt R. E. Havercroft (fourth from left), next to him Flt Lt C. B. F. Kingcome, then Sqn Ldr J. A. Kent (holding the scoreboard), Flt Lt J. W. Villa, Plt Off C. H. Saunders, Flg Offs R. H. Holland and A. R. Wright and Sgt D. E. Kingaby. Kingcome, Kent and Kingaby all claimed Bf 109F victories, the latter being credited with five destroyed, two probables and one damaged. (IWM CH 2538)

pilots saw six other 109s approach from the south after the dogfight had been going on for some time.

In the meantime, the two higher squadrons (616 and 145) had lost touch with the leading squadron (610) and 616 did not see any enemy aircraft, and eventually returned to base. 145 ran short of oxygen and returned to its base at 1340 hrs without having anything to report.

Conclusion – this whole operation seems to have been unfortunate and it was incredible that four 109s with only 500ft advantage in height should have been able to break up completely a squadron of 12 Spitfire IIs and presumably bring down four of them, and that no information can be obtained as to what happened.

Very short notice of this operation was given by Group and in fact 610 Squadron only received orders at 1215 hrs to leave the ground at 1230 hrs. This was the first notification the Squadron had had that there was to be a sweep, and actually at that time Red Section was in the air on an operational flight. It just had time to land and refuel and took off at 1230 hrs with the rest of the squadron.

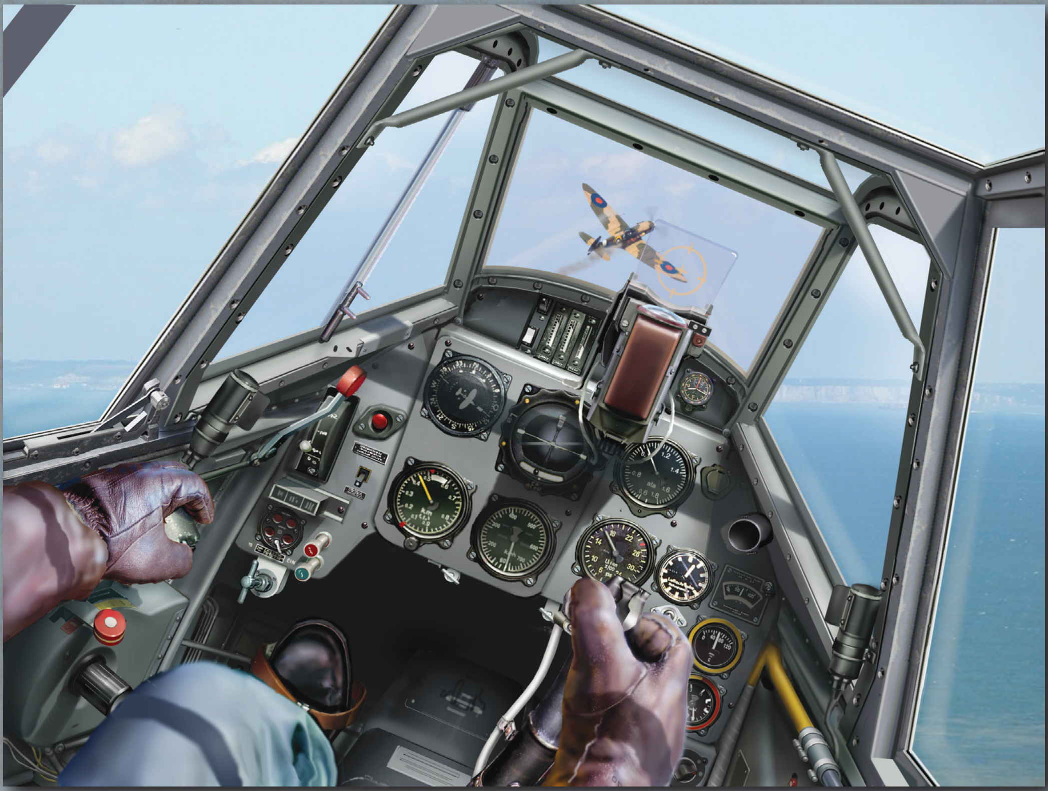
Recommendations – if possible, considerably more notice should be given of a large operation of this sort so that squadron leaders can get together and discuss details. In this particular case the S/Ldr of 610 did not know there was going to be a sweep and as a result the Wing was led by a flight commander.

No operational orders have been issued as to what should be done in the event of the fighter formations missing the bomber formation.

Squadrons are keeping too far apart – in this case 5,000ft between the top and bottom squadrons – with the result that they lost each other. Squadrons should not be more than 1,000ft apart or at any rate close enough to keep in touch.

If possible, squadrons detailed for sweep or large scale operations should not be given operational jobs for at least an hour before the sweep commences. Pilots in 610 Squadron had breakfast at 0830 hrs and were not able to obtain their next meal until 1830 hrs,

ENGAGING THE ENEMY



All Bf 109s were fitted with different versions of the Reflexvisier (dubbed Revi in frontline service) reflector gunsight. The Revi C12D fitted to the Bf 109F differed from its predecessor, the C12C, in having its orange-coloured reticule calibrated for fixed gunnery as well as bombing. All C12 gunsights lacked computing aids of any kind. They did, however, have a built-in dimmer to regulate reticule intensity. The glass onto which the reticule was projected was manufactured as 'sun dark', which also helped to reduce glare. Some pilots – most famously Adolf Galland – had various types of telescopic sight fitted alongside the C12D as an out-in-the-field modification, striving to harmonise them with the standard reflector gunsight. They would not collimate, however, which meant that their only use was to allow pilots to identify objects that were usually beyond clear visual range with the naked eye. The Bf 109F boasted an ergonomically designed KG 12A grip, which allowed for the simultaneous firing of both the cowling machine guns and the engine-mounted cannon. The grip was also fitted with a radio actuation button.

when they were given 30 minutes notice until 1900 hrs. They expect this kind of thing when there is a 'blitz' on, but it seems rather unnecessary during the present quiet times.

Including time from takeoff to 28,000ft, pilots run short of oxygen in about one hour and consequently have often to return from patrol. Would it not be advisable for Spitfires to carry two bottles of oxygen? Super long-range PRU Spitfires now carry three bottles.

The average number of experienced war pilots in squadrons I have visited lately is five and I don't think squadrons are being allowed nearly enough training from their experienced pilots. Squadrons ought to go up and carry out surprise attacks on each other, and especially practice regaining formation after being split up. I think perhaps fighter pilots are so busy keeping formation that they are not able to keep a good enough lookout.

Despite having to adopt a more defensive posture, the Jagdwaffe was still keen to dominate the Channel and the southeast corner of England whenever possible. As the weather improved in March and April 1941, the returning *Jagdgeschwader* would undertake 'Freie Jagd' patrols. Typically, a handful of Bf 109s made landfall at Dungeness, circled north to Sheerness and then turned southeast to leave England via the North Downs. These missions, together with the interception of 'Circuses' as they appeared more frequently over France, allowed future high-scoring aces to claim their first victories with the F-model. Oberfeldwebel Josef Wurmheller of II./JG 53 and Hauptmann Hermann-Friedrich Joppien of I./JG 51 enjoyed early success. So too did Oberstleutnant Adolf Galland, *Kommodore* of JG 26. On 15 April, during his first day of operational flying in an F-model, he claimed two Spitfire IIAs destroyed and one probable. All his victims were from No. 266 Sqn. He would be credited with a total of 36 victories in the Bf 109F by year-end, taking his tally to 94 overall. Galland described the action in his autobiography, *The First and the Last*:

> 15 April was Osterkamp's birthday [World War 1 ace Theo Osterkamp was the Luftflotte 2 *Jagdfliegerführer* at Le Touquet] and he invited me to come over. As a present, I packed a huge basket of lobsters with the necessary bottles of champagne into my Me [Bf] 109F and took off, with Oberfeldwebel [Hans-Jürgen] Westphal as my wingman. It was too tempting not to make a little detour on the way and to pay a visit to England. Soon, I spotted a single Spitfire. After a wild chase fate decided in my favour. My tough opponent crashed in flames in a little village west of Dover.
>
> A few moments later we saw a flight of Spitfires climbing ahead of us. One of them lagged behind the formation. I approached him unnoticed and shot him to smithereens from a very short distance. We flew right on, close to the formation, where I shot down a third Spitfire, which I nearly rammed. I was unable to observe the crash. Westphal was now in a good firing position but suddenly his guns jammed. Now it was time to bolt as the Spitfires waded in on us. Throttle full open in a power dive down to the Channel! We were heavily attacked. Westphal was noticeably faster than I. Something was wrong with my crate.
>
> As I came in to land at Le Touquet the ground staff waved frantically and fired red light signals. At last I understood their gestures: I had nearly made an involuntary crash landing. When I worked the mechanism to let down the undercarriage it did not go down but retracted instead. It must have been down the whole time. I must have touched the button with my knee during the action over England. I remembered that I had had to do some readjusting with the trim tabs and that the flying properties of the aeroplane had definitely changed. Lobster and champagne bottles were safe. Hunter's luck! Together with the report of the Spitfires, I handed the birthday present to Osterkamp.

The Spitfire V was now on the verge of frontline service over France following a series of mechanical problems and political intervention from the Prime Minister himself. Churchill had minuted ACM Portal, on 28 February, 'It would be a mistake to exhibit the Merlin 45 to the enemy till there are at least half a dozen squadrons capable of using them. Certainly, they should not be used over the other side without further instruction.' Although Portal agreed to the Prime Minister's request, he eventually managed to persuade Churchill to rescind his order by explaining that 'there is nothing in the Merlin 45 which the Germans could themselves make use of with advantage in the near future. There is nothing new for the pilots to learn in the way of tactics and handling of the aircraft, such as might justify the holding back of an entirely new type of fighter until we are ready to spring an effective surprise on the enemy.' He also noted that it would take several months to re-equip six squadrons with the new fighter.

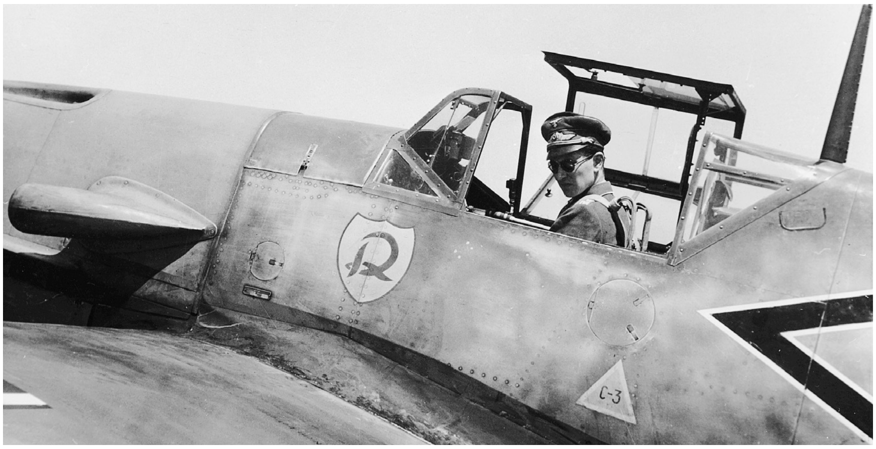
It would appear that the first encounter between the Bf 109F and the Spitfire V finally occurred on 11 April when four fighters from No. 92 Sqn were scrambled to attack an He 59 seaplane that was under tow towards Boulogne harbour. It was quickly sunk by the strafing Spitfires, but then they were bounced by a number of 'Friedrichs' from III./JG 51. Sgt T. G. Gaskell was shot down and killed by future 55-victory ace Leutnant Hermann Staiger. No. 92 Sqn opened its account with the Mk V when Bf 109s were downed off the Kent coast on 24 and 26 April, the latter machine being Unteroffizier Werner Zimmer's F-2 from 4./JG 53, which was destroyed by ace Plt Off Ronnie Fokes. Zimmer was killed.

Oberstleutnant Mölders' arch-rival in the race to be the Luftwaffe's ranking ace during the early Channel Front period was Oberstleutnant Adolf Galland, *Kommodore* of JG 26. Seen here in typically relaxed pose, with a cigar in his left hand, Galland is wearing an RAF Bomber Command issue Irvin sheepskin flying suit over his service dress. Although very bulky for the Bf 109's narrow, cramped cockpit, such suits were highly coveted amongst *Jagdflieger* during the winter months on the Channel Front. (EN-Archive)

The Mk V had become operational at almost the same time as the Bf 109F-2. The German fighter's maximum speed of 373mph at 19,700ft and service ceiling of 36,100ft were remarkably similar to those of the Spitfire VB. However, the Bf 109F could climb higher than the British fighter, as No. 92 Sqn's Walter 'Johnnie' Johnston discovered during a sweep in the summer of 1941:

> We used to get up to 25/26,000ft quite regularly, but 30,000ft and above was really stretching it. On those occasions it was bitterly cold. On one trip we were up high and all of us were really hanging on our props. I was flying No 3 behind James Rankin and we were at the point where, if we tried to fire our cannon, we would have stalled. Then I looked up to starboard and, completely unannounced, a 109 came up alongside us. He was slightly above and he knew damned fine that he was as safe as houses. He looked over and gave me a wave and then pulled up and climbed merrily away, and I thought 'My God, what would I give for that?'

As well as boasting superb performance at high altitude, the Bf 109F-2 was also the superior aircraft low down. It was 27mph faster than the Spitfire V at 10,000ft and had a better rate of climb. Indeed, it was reported that a good pilot could perform four complete rolls while climbing before having to level off. Like the E-model before it, the 'Friedrich' was also quicker both in a dive and a zoom climb. The direct fuel-injection system fitted to its engine enabled pilots to join and break off combat at will. While the standard evasive half-roll and steep dive was still employed by Bf 109F

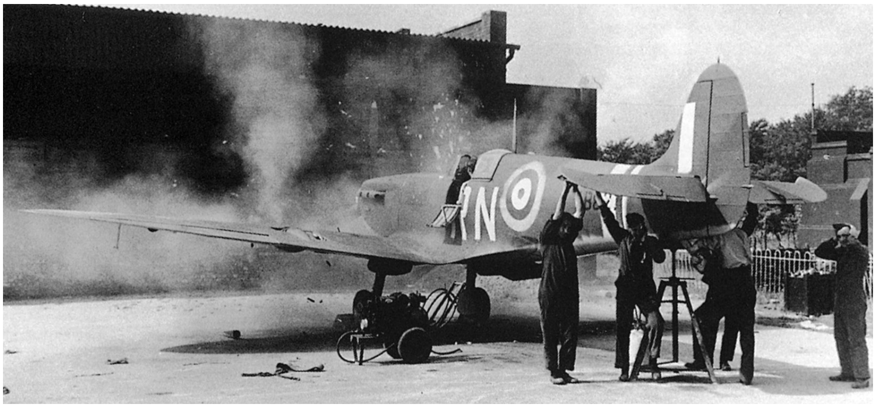


Some early Bf 109Fs suffered structural failure when subjected to high-g manoeuvring, resulting in a number of pilots being killed. Perhaps the most prominent victim of the 'Friedrich's' fragility was 40-victory ace Hauptmann Wilhelm Balthasar, *Geschwaderkommodore* of JG 2. Seen here in an earlier F-2, he was killed when the wing of his Bf 109F-4 broke off during a dogfight with Belgian ace Flg Off Victor Ortmans of No. 609 Sqn near Aire on 3 July 1941. Ortmans claimed to have damaged a Bf 109 during this engagement, so Balthasar's demise may, in fact, have been caused by enemy fire. Balthasar had enjoyed considerable success with the Bf 109F immediately prior to his death, claiming six Blenheims and five Spitfires between 17 May and 27 June 1941. (EN-Archive)

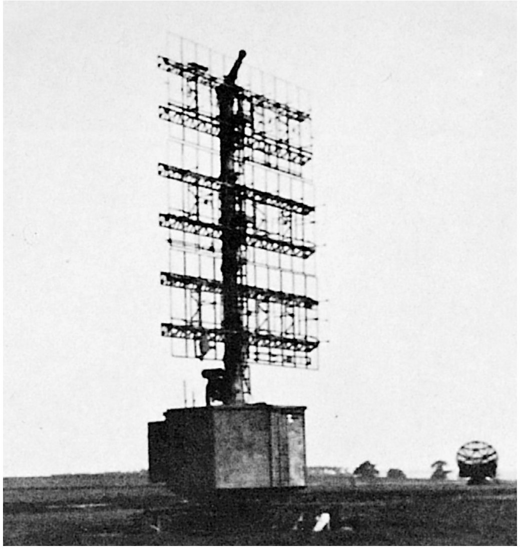
pilots – as it had been when they were flying the 'Emil' – such a manoeuvre usually resulted in the engagement being broken off or the resulting loss of height placing the *Jagdflieger* at a tactical disadvantage. The 'Friedrich's' improved performance, however, gave its pilots the confidence to disengage from the Spitfire by climbing away and re-engaging from a tactically advantageous position. This was particularly marked at altitudes above 2,500ft.

The Merlin's float-type carburettor, by contrast, ceased to deliver fuel during sustained manoeuvres involving negative G, causing the engine to cut out. Bf 109 pilots had soon learned that when being chased by a British fighter, a bunt followed by a high speed dive was usually enough to shake off any adversary. This continued to be the case with the Mk V until modifications were made to later aircraft. But the Spitfire V could still out-turn any German fighter, as had been demonstrated by the Mk I/II. Bf 109F pilots usually stuck to the 'one pass and away' rule that had been observed in 1940. Yet, according to JG 26 historian Don Caldwell, author of *The JG 26 War Diary* (Vol 1), some more experienced *Jagdflieger* felt confident enough in their new 'Friedrichs' to challenge the Spitfire in the horizontal plain too:

> Flg Off Franciszek Surma of No. 308 Sqn [participating in 'Circus No. 100A' on 20 September 1941] had a long, inconclusive dogfight over the Channel with an



Spitfire VB AB822 of No. 72 Sqn spews out rounds from its 20mm Hispano cannon during firing at the stop butts, probably at Biggin Hill in September 1941. Note the hefty brass cartridge cases falling under the port wing. Almost certainly this firing was set up for the photographer for it formed no part of the gun harmonisation process for the Spitfire. If the serviceability of a gun was suspect, that weapon was usually removed and tested individually. AB822 was delivered new to No. 72 Sqn on 30 August 1941 and failed to return on 26 October that same year, having been downed by a Bf 109F from *Stab* JG 2 off Dover during a 'Rodeo'. Its pilot, Sgt L. Stock, was killed, his adversary being either Major Walter Oesau or Oberleutnant Rudolf Pflanz – both high-scoring *Experten*. (Dr Alfred Price) experienced German pilot. His opponent was almost certainly from JG 2, but these comments from his combat report are pertinent: 'From my experience on this Circus I have formed the opinion that the Me 109F is superior to the Spitfire V in both speed and climbing power. The German pilots' tactics have changed as they did not attack from high above, but mostly on the same level.' This was a prescient observation. The superiority of the Spitfire in turning combat was drummed into the German pilots from flight school, especially by instructors who had been withdrawn from the Western Front for a rest. The pilots of the *Kanalgeschwader* now had enough confidence in the Bf 109F to take on the Spitfires on the latter's own terms.



The Luftwaffe was quick to build up an air defence system to oppose the RAF's raids. Freya FuMG 39G (left) and Würzburg (right) early warning radar sets were located in the Pas-de-Calais area to give fighter units timely notice of impending attacks. Operating on a waveband of between 1.8 and 2.0 metres, early versions of the Freya had an effective range of 37 miles, which was later improved to 75 miles. The Freya sets located and tracked incoming aircraft, with the Würzburg determining the exact range and height as they came closer. (EN-Archive)

Although now capable of matching the Spitfire in respect to its manoeuvrability, the Bf 109F was at a disadvantage in terms of firepower. The Spitfire I/II had been outgunned by the Bf 109E from the start of the war, but the cannon-armed Mk VB packed a more destructive punch than the F-model. Its two 20mm Oerlikon cannon and four 0.303 in. machine guns gave it a greater weight of fire than the single 15mm or 20mm cannon and two 7.92mm machine guns in the 'Friedrich'. The reduced weaponry of the F-model came in for such criticism from frontline pilots that Messerschmitt made it a priority to rectify this with the follow-on Bf 109G. This variant entered service on the Channel Front in the summer of 1942.

In the spring of 1941, the Spitfire V and Bf 109F were more or less equally matched in their encounters over France as the RAF's daylight offensive increased in scope. The Jagdwaffe units, however, would be at a distinct tactical advantage. Not only were they able to pick and choose when they engaged in combat, they were also fighting over friendly territory.

By early June Nos. 91, 74 and 609 Sqns had received Mk Vs, with the latter two units joining No. 92 Sqn within the Biggin Hill Wing. Although this new mark of Spitfire gave Fighter Command a boost as the tempo of the offensive against targets in France increased, losses suffered by No. 11 Group began to mount as more *Jagdgeschwader* equipped with late-model 'Emils' and new 'Friedrichs' returned to the Channel Front. The Luftwaffe had been quick to build up an air defence system to oppose these raids, with Freya FuMG 39G and Würzburg early warning radar sets in the Pas-de-Calais combining with the German radio Listening Service to give fighter units timely notice of impending attacks. The *Jagdgeschwader* adopted an alarm-start system similar to that employed by Fighter Command the previous summer, scrambling aircraft against approaching formations as weather and time permitted. Although the RAF chose the time, course and strength of their raids, the advantage rested with the Luftwaffe. Its fighter pilots usually enjoyed the all-important advantage of height and surprise when launching their attacks. And just as Fighter Command had formed No. 421 Flight in the autumn of 1940 to check on the strength and composition of impending raids, the Jagdwaffe resorted to a similar tactic as RAF fighter sweeps increased in frequency. Two or three 'spotters' would be sent aloft, and if they reported bomber formations in strength, large numbers of Bf 109s would be

Pilots of No. 609 Sqn enjoy an impromptu game of cricket at their dispersal at Biggin Hill during the summer of 1941. The Spitfire VB providing the backdrop is W3238/PR-B *The London Butcher*, which was the personal mount of the CO, Sqn Ldr 'Mickey' Robinson. Paid for by the London Retail Meat Traders Association, it was issued new to No. 609 Sqn in May 1941. Robinson claimed five Bf 109Fs destroyed and four damaged in this aircraft between 30 June and 12 July. The balding wicketkeeper in this shot is Sgt Tommy Rigler, who was credited with eight Bf 109 victories with No. 609 Sqn, four of them F-models. (Dr Alfred Price)

scrambled. If there were no bombers, the *Jagdgeschwader* would remain on the ground due to the numerical strength of Fighter Command.

The imbalance between the two sides in terms of fighter strength would increase dramatically from late May 1941 as the Luftwaffe started redeploying for the planned invasion of the Soviet Union on 22 June. Conversely, the RAF stepped up its campaign by launching its Non-Stop Offensive on 16 June. This was aimed at inflicting further losses on the now depleted Jagdwaffe to the point where the RAF hoped it would take control of the skies over France. Although dubbed the 'Nonsense Offensive' by Nazi propagandists, Fighter Command was buoyed by the level of opposition provoked by the raid. By now only JG 2 and JG 26 remained in the west. Between them they were able to field around 250 fighters, although no more than 150 were serviceable at any one time. Even so, they were more than able to inflict growing losses on the RAF formations, taking a particularly heavy toll of Fighter Command units. Historian Donald Caldwell explained how more British aircraft were sent into combat from the early summer of 1941, and the tactics that were so effectively employed by the *Jagdgeschwader* to counter the Non-Stop Offensive, in *The JG 26 War Diary* (Vol 1):

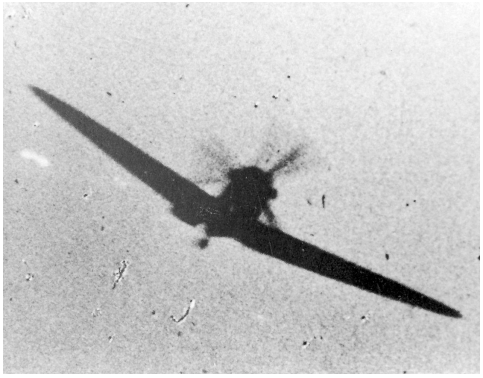
The rear cockpit armour fitted to the Bf 109F saved Adolf Galland from certain death when he was bounced by the Spitfire II flown by No. 145 Sqn's Sgt Larry Robillard on 2 July 1941. 'I slugged it out with Adolf Galland – with deplorable results for both of us', Canadian Robillard recalled post-war. 'I saw his Me 109F attacking our Blenheims and latched on to his tail. He sliced down in a sharp descending turn, twisting and turning as he went to shake me off his tail. Still, I managed to close the gap, squeezed the trigger and saw flashes of impacting rounds tearing into the starboard side of his cockpit. I was about to finish him off when suddenly I saw tracers whizzing by – there were more Jerries hurtling down on me from the sun.' The timely intervention of four Bf 109Fs saved Galland, Robillard being forced to bail out of his Spitfire II when he lost part of a wing trying to turn into his opponents after they had made a head-on pass. He successfully evaded capture and made it back to the UK in October 1941. (EN-Archive)

> The ability of JG 26 to penetrate the escort would lead to larger and larger British formations. A 'Circus' ultimately required up to 20 squadrons of fighters, some 240 aircraft, to protect a dozen or so Blenheims. The fighters were deployed as follows. First across the target were three Target Support Wings, each of three Spitfire squadrons. One paralleled the path of the bombers, overtaking them en route. The other two approached from different directions, crossing in the vicinity of the target. They then split up into flights of four, which had

> finally replaced sections of three in most (but not all) Fighter Command squadrons, and patrolled the target area until their fuel state forced them to return. The Escort Wing contained four squadrons of Spitfires or Hurricanes. Their functions can be inferred from their titles – Close Escort, Medium Escort, High Escort and Low Escort squadron. The obsolescent Hurricanes were replaced by Spitfires over the course of 1941. Above the Escort Wing was the Escort Cover Wing of three squadrons, while coming along behind to mop up were the Forward Support Wing and the Rear Support Wing, each of two squadrons. The deployment of this armada required great skill by the British ground controllers and airborne wing commanders. Timing was critical because of the British fighters' short endurance, which limited them to targets no further inland than Lille. Cloudless conditions were essential at the assembly point over southern England, thus 'Circuses' were rarely attempted other than in the spring and summer months.
>
> The German defenders did not attempt to confront these massive formations directly. JG 26 entered combat in *Staffel* or *Gruppe* strength, rather than as a *Geschwader*. The German battle plan never changed: their fighters were to get off the ground quickly, gain height and make use of sun and cloud to attack any part of the enemy 'beehive' that appeared vulnerable. General Osterkamp and his two *Kommodoren*, Galland and Hauptmann Wilhelm Balthasar of JG 2, understood that their role was to inflict maximum damage on the RAF while preserving their own limited forces. It was not required or expected that the bombers be attacked by every German intercept formation. Only the most skilled formation leaders, such as Galland himself, could judge the proper moment at which the escort could be penetrated at minimum risk in order to reach the bombers. The British fighters were even less of a threat to the Germans than the bombers. For German morale and propaganda purposes it was essential that every reasonable opportunity be taken to inflict harm on the RAF, but fairly strict guidelines had to be met. According to Fighter Command's combat reports, Luftwaffe fighter formations large and small 'avoided combat' on most RAF missions, to the frustration (or relief) of the Allied pilots – but the well-disciplined German pilots were just following orders.

As Donald Caldwell noted, Adolf Galland was the master tactician on the Channel Front in 1941. When JG 26 was ordered aloft, he would take his time to position his fighters, waiting patiently for moments of confusion in the large and often unwieldy RAF formations. A year earlier, Fighter Command had endeavoured to shoot down bombers at almost any cost. The tactics employed by the Jagdwaffe in 1941, however, greatly reduced the risk of losses amongst its *Jagdgeschwader*. Galland would always try to position his fighters higher and to the rear of their often unsuspecting prey, their presence being hidden by the sun behind them. Once in position, he would lead a slashing attack through the fighter screen to the bombers, firing as they closed on

No. 74 Sqn suffered a severe blow on 27 June 1941 when its CO, 23-year-old Sqn Ldr John Mungo-Park (flying Mk VB X4668/ZP-E), was shot down and killed. His unit had engaged two formations of Bf 109Fs led by *Experten* Hauptmann Wilhelm Balthasar, *Geschwaderkommodore* of JG 2, and Hauptmann Rolf Pingel, *Gruppenkommandeur* of I./JG 26. The shattered remains of X4668 are seen here being examined by German troops near Adinkerke, in western Belgium. (Chris Goss)



The Northolt Wing lost three Spitfire IIs while providing the escort for 'Circus 26' on 28 June 1941, including this No. 303 Sqn machine (P8346) flown by Plt Off J. Bondar. This image came from the gun camera footage shot by Hauptmann Gerhard Schöpfel, *Gruppenkommandeur* of III./JG 26 – the Spitfire was his 25th of 40 victories. Bondar was killed. (John Weal)

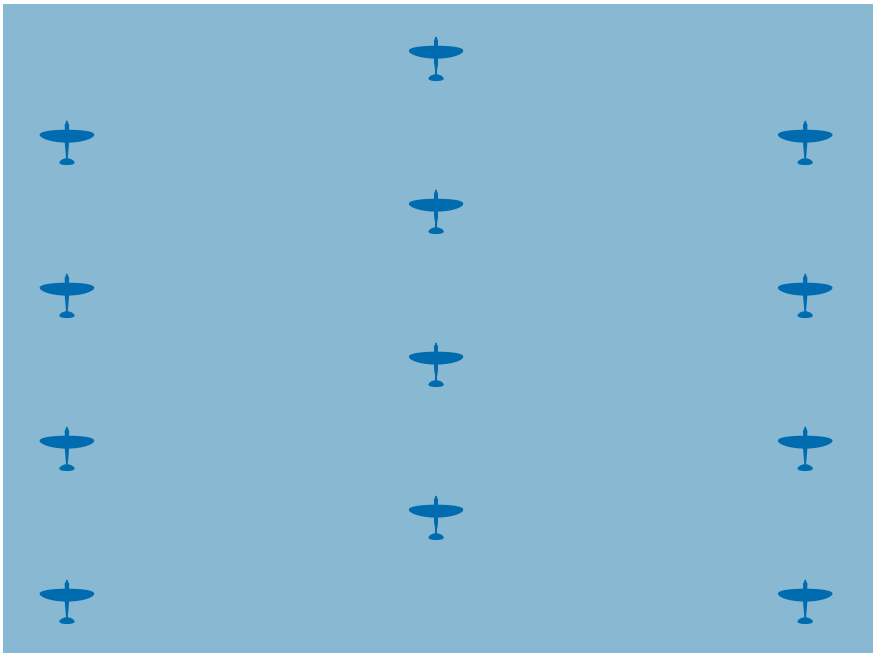
the Blenheims and Stirlings. The pilots would then continue down to outrun any pursuers thanks to the Bf 109's superior performance in a dive. Galland also employed another method of attack that could be far riskier to his men. He would order the majority of his fighters to remain above the escorts and attract their attention while he led a *Rotte* or *Schwarm* from his *Stab* to attack from below. This tactic worked best in a cloudy sky because it allowed the hunting Messerschmitts to close on their prey unobserved.

Proof of just how proficient JG 2 and JG 26 had become with the Bf 109F came with the claims made by the two units between 22 June and 31 December 1941. No fewer than 838 victories were credited to the *Jagdflieger*, for the loss of 100 pilots killed or missing, one captured and 48 wounded. These units had had 168 fighters destroyed, 110 of them in combat. In the same period 1,036 RAF aircraft were destroyed and 464 heavily damaged during the Channel Front offensive. Conversely, the pilots of Fighter Command claimed to have shot down 731 German aircraft. This glaring disparity between claims and losses was a repeat of Fighter Command's inflated tallies of the summer of 1940.

Clearly, the Luftwaffe had won the battle over Occupied France in 1941. It would continue to do so the following year as the Spitfire VB struggled to protect the growing number of medium and heavy bombers committed to the Channel Front campaign from attack by the Fw 190 and the small number of high-altitude Bf 109G-1s that entered service in the summer of 1942. Nevertheless, the RAF's numerical superiority in 1941 would only increase as the war went on, denying the Germans a tactical victory in countering the British Non-Stop Offensive. During 1941 Spitfire production far exceeded losses, allowing a massive expansion in the number of units operating the type so that by the end of the year 46 squadrons were flying Spitfires, mostly Mk Vs.

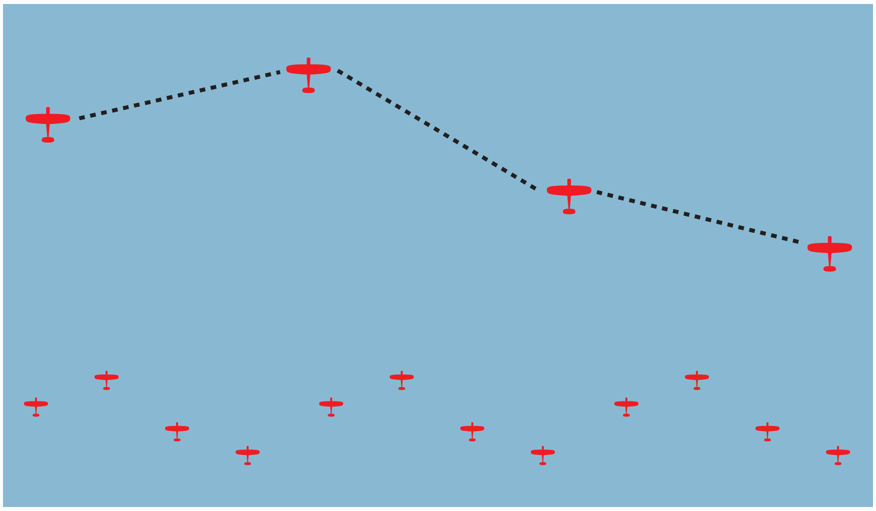
In an attempt to reduce the casualties being inflicted on their units, a number of wing leaders began to abandon the traditional battle formation flown by Fighter Command for many years. Several units had, in fact, taken it upon themselves to modify their formations when going into combat during the Battle of Britain. Spitfire-equipped No. 74 Sqn was at the forefront of these changes. At the time its CO, Sqn Ldr 'Sailor' Malan, was effectively the Werner Mölders of Fighter Command, being one of the best tacticians in the RAF. He had claimed nine Bf 109Es destroyed during 1940 and would add at least 13 more during 1941, so his theories on fighter formations had been formulated through bitter combat experience.

In March 1941 the first wing leaders were appointed. At Biggin Hill, Wg Cdr A. G. 'Sailor' Malan was promoted to the position following his success as CO of No. 74 Sqn from early August 1940. One of Fighter Command's leading tacticians, he was also an accomplished ace credited with 27 and seven shared victories, including nine Bf 109Fs. (IWM CH 12661)

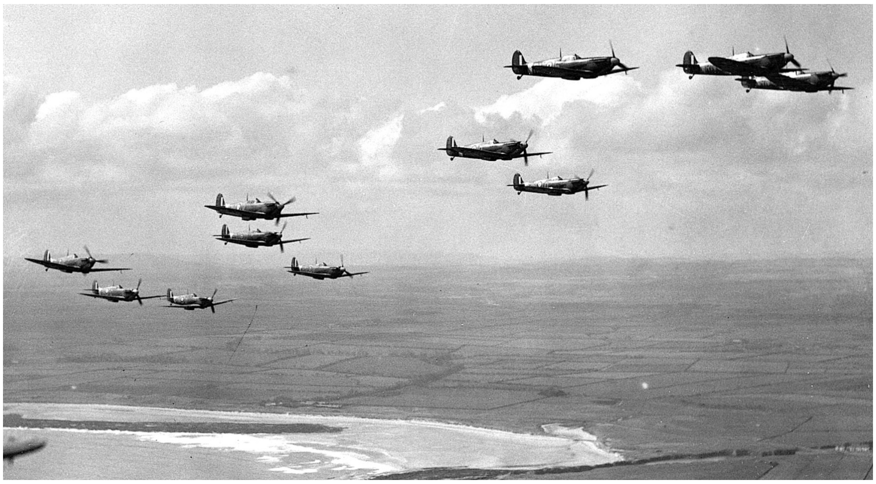


The loose line-astern formation widely adopted by Fighter Command from late 1940 onwards in place of the pre-war battle formation had been championed by Sqn Ldr 'Sailor' Malan when he was CO of No. 74 Sqn during the latter stages of the Battle of Britain. When employing such a formation, pilots could provide each other with better mutual support if engaged by the enemy. There was also improved coverage of blind spots to the rear and better cohesion if forced to turn in combat. Loose line-astern formation also proved to be much easier to fly than rigid battle formation.

During the final stages of the Battle of Britain, Malan began dividing his 12-aircraft formations into three sections of four, rather than the traditional four sections of three in an unwieldy 'vic'. Now, if a formation of Spitfires broke up after being bounced, its four-aircraft sections would split into two fighting pairs and operate in a similar way to the German *Rotte*. With the three section leaders flying in a widely-spaced 'V', and the rest of their sections in line astern behind them, Malan's formation now possessed mutual support, coverage of blind spots to the rear and cohesion if forced to turn in combat. The loose line-astern formation was much easier to fly than a tight battle formation, thus freeing pilots to look for the enemy rather than watching what their section leader was doing. Malan's new formation was soon officially implemented



German fighter units opposing the RAF's Channel Front operations used tactical formations that had been devised by ranking ace Werner Mölders following his experiences in the Spanish Civil War. The basic fighting unit was the two-aircraft *Rotte*, two of which were combined to form a *Schwarm*. The leader of each pair, and his wingman, flew far enough apart to allow them to remain in formation with the minimum of effort, while concentrating on searching the sky around them. Typically, *Staffeln* flew with *Schwarme* in loose line-abreast formation covering about a mile of sky.



No. 72 Sqn Spitfire IIAs form up off the Northumberland coast in the early summer of 1941 during a unit-strength training flight from Acklington. The unit, led by Australian Battle of Britain pilot Sqn Ldr Des Sheen, was still operating in 'vics' of three at this point, with the aircraft having closed up specially for the photographer, strapped into a Blenheim bomber. No. 72 Sqn would be posted south to Gravesend in early July 1941 to relieve No. 74 Sqn, which had suffered heavy losses between 9 June and 7 July – 15 Spitfires and 14 pilots, all to JG 26, to be precise. Receiving the latter unit's surviving Spitfire VBs upon its arrival in No. 11 Group, No. 72 Sqn suffered nine losses to Bf 109Fs in its first two weeks of Channel Front operations. (Dr Alfred Price)

throughout Fighter Command, as was the German 'finger-four' *Schwarm*. This had been championed by Douglas Bader who, like Malan, was both an ace and, from March 1941, one of the first wing leaders.

No. 616 Sqn's Plt Off 'Johnnie' Johnson was one of the pilots within the Tangmere Wing led by Bader, and he was impressed by the legless ace's leadership qualities:

> When we began to reach out and take on the Luftwaffe over the Pas-de-Calais, Douglas's greatest qualities came to the fore – leadership, the ability to inspire and his great desire to get out and at them. It was quite extraordinary. The qualities of moral courage, the ability to command, and the fact that he spoke the same language as these chaps – I was still a pilot officer and Douglas was a wing commander. We were all rather like his pupils. Like master and apprentice. He always went to great lengths to have a post-mortem afterwards and explain things to us. Everyone loved him.

Wg Cdr Douglas Bader was another of the early wing leaders, being appointed to control the Tangmere squadrons. Like his contemporary, Malan, he too led the way with tactical changes such as the adoption of the German 'finger-four' *Schwarm.* Bader was also a high-scoring ace, with 20 and four shared victories to his name by the time he was brought down over France while dogfighting with JG 26 on 9 August 1941. Fighter Command lost 11 Spitfires and nine pilots that day, while JG 26 claimed 14 victories for the loss of a solitary Bf 109F and its pilot. (Dr Alfred Price)

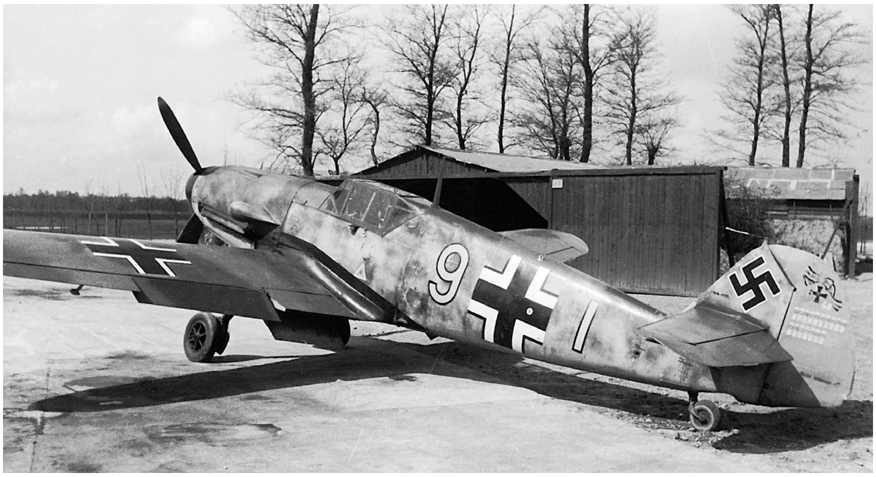
> Tactically, because the enemy abreast formation was better than the three-vic astern pattern, Fighter Command lagged behind the German Fighter Arm. It was not until this spring [1941] that Douglas Bader copied the *Schwarm*, which he called the 'finger-four' because the relative positions of the fighters are similar to a plan view of one's outstretched fingertips. Bader's pilots were immediately impressed with their 'finger-fours', for, unlike the line astern pattern, all pilots were always covered, and all stood an equal chance of survival. Soon all fighter squadrons followed Bader's lead.

Yet according to Johnson's squadronmate, Flg Off Hugh Dundas, there was some resistance to the 'finger-four'. 'A number of other wings adopted this idea, although there were exceptions. The Biggin Hill Wing, for instance, led by "Sailor" Malan, continued to fly with their aircraft in line astern. Malan was never converted and there were many arguments over the years between those who supported his tactics and those who adopted "finger-four". For myself, I was a militant champion of the new method and stuck to it unwaveringly until the end of the war.' The line astern formation seemed to remain longest with wings in Nos. 10 and 12 Groups, which did not see quite as much action as units in No. 11 Group. Sgt Sid Watson of No. 234 Sqn, which was part of No. 10 Group's Ibsley Wing on the south coast, was still flying in line astern formation as late as 1943. He was adamant that such tactics contributed to the high attrition rate suffered by Spitfire units in 1941–42. On his first mission, which he had to abort with engine problems, his flight lost four aircraft and their pilots (one killed and three captured). He reported:

During the second half of 1941 Fighter Command's Spitfire squadrons suffered badly at the hands of the Jagdwaffe and its Bf 109Fs – virtually all remaining 'Emils' had been replaced by F-2s and F-4s by mid-summer. This rather large 'trophy' resided in 9./JG 2's dispersal area at St Pol during this period. (John Weal)

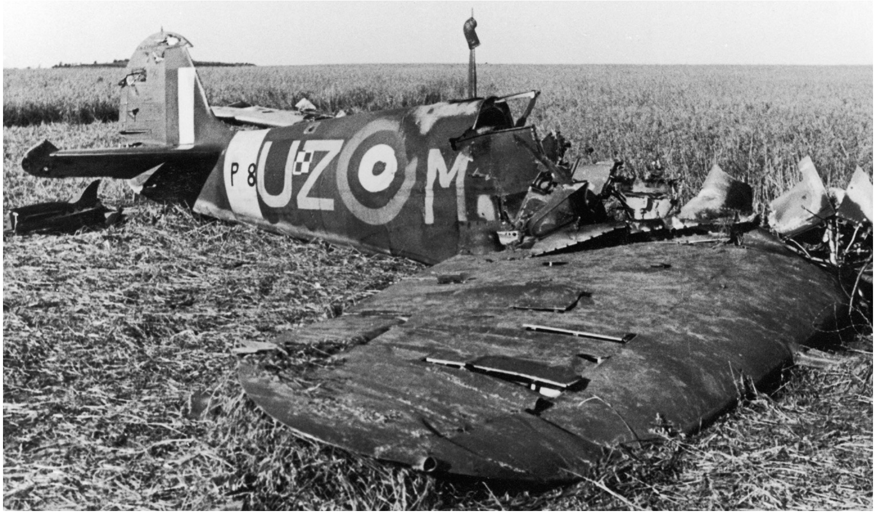
> Because of the formation that was flown by the RAF – i.e. three sections of four in line astern – it was almost impossible to keep a good look out because all one's time was spent trying to play follow the leader. This silly formation stayed with us until 1943, when Wg Cdr 'Laddie' Lucas took over. He inaugurated the 'finger-four' approach (as used by the Germans) and it was a great improvement. Even then there were still some that resisted, if that can be believed!

By the end of 1941 Fighter Command was stronger than ever despite the heavy losses suffered during the second half of the year. The infrastructure was now in place for continued expansion, both in terms of aircraft production and pilot training. Those individuals fortunate enough to have survived months of combat were by now battle-hardened, and ready to impart their experience and expertise to new pilots



Bf 109F-2 Wk-Nr 9552 was assigned to 9./JG 2's *Staffelkapitän*, Oberleutnant Siegfried Schnell, the leading ace on the Channel Front in terms of Spitfire II/Vs destroyed. His immaculate fighter is seen here shortly after he had scored his 57th victory on 4 June 1942. (EN-Archive)

This aircraft from No. 306 Sqn was one of 11 Spitfire VBs lost on 17 September 1941. Nine of them had been downed while supporting 'Circus 95'. Its pilot, Plt Off C. Daszuta, spent the rest of the war as a PoW in Stalag Luft III. Having force-landed his stricken machine in a cornfield, Daszuta had time to set it alight before he was captured. (John Weal)



Scores may have been rising for the Bf 109F *Experten* during the summer of 1941, but the strain of the RAF's newly launched Non-Stop Offensive (which commenced on 16 June) was beginning to tell on the *Jagdflieger* of JG 2 and JG 26. This serious-looking pilot is Oberleutnant Siegfried Schnell, *Staffelkapitän* of 9./JG 2. He was credited with destroying 40 Spitfires flying the Bf 109F between 21 June 1941 and 26 June 1942 – 14 of them were downed in a six-day period between 3 and 9 July 1941. (John Weal)

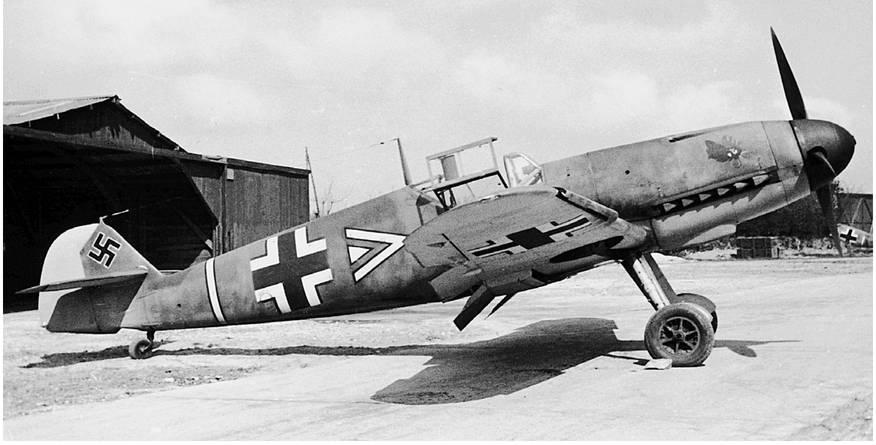
leaving the OTUs and being sent to frontline units. Yet despite the advent of the new tactics, the arrival of Spitfire VBs and a steady increase in the number of Fighter Command squadrons, a growing number of Channel Front veterans were becoming increasingly disillusioned with the seemingly endless cycle of operations over France, together with the growing casualty list.

Many of these pilots had survived the Battle of Britain, yet they had no hesitation in stating that flying 'Circuses' and 'Rhubarbs' was far more nerve-racking. They particularly detested crawling along at less than 200mph as they escorted the Blenheims and Stirlings over France, being rocked around by exploding flak and nervously waiting for enemy fighters to bounce them. Once engaged, to stand any chance of survival, let alone defeat an aggressive and often elusive enemy, a Spitfire pilot would have to wring every ounce of performance from his machine. This could physically drain him in just minutes, as future high-scoring ace Plt Off Neville Duke of No. 92 Sqn recalled:

> Despite a lot of adrenalin flowing, there was considerable physical effort involved in handling the controls during high-G manoeuvres while at the same time straining to hold off black-out. Pre-engagement, there had to be a constant scanning to the rear, which was pretty wearing on the neck. Chafing was relieved by wearing a parachute silk scarf. Of course it was very cold at altitude, with no heating in the Spitfire. Numb hands were a particular problem, in spite of wearing silk inner gloves and outer gauntlets. Fur-lined boots were the norm. Misting or icing up was also a major difficulty. Ice occurred mainly on the inside of the front bulletproof screen.

Squadronmate Sgt Walter 'Johnnie' Johnston recalled how he coped with violent manoeuvring when trying to engage enemy fighters:

> In a steep turn you were pulling an awful lot of G but you became adept at seeing a little bit of grey come across your eyes and you knew that you were



At the time this photograph was taken at St Pol in the autumn of 1941, the *Kommandeur* of III./JG 2 was Hauptmann Hans 'Assi' Hahn and it is believed that this Bf 109F-4 was one of the machines assigned to him. Although it does, indeed, carry the full *Stab* markings to indicate the seniority of its pilot, the 'Friedrich' lacks a victory tally. Hahn's last victory in 1941 came on 13 October, taking his tally to 46, and his score had reached 105 by the time he was forced down behind Soviet lines and captured on 21 February 1943. (EN-Archive)

> about on the verge of blacking out. Then you either kept it where it was or eased off a little bit. You could hear all right, but you just couldn't see properly. I think everyone blacked out a number of times; hauling it around, you actually went before the aircraft shuddered, but with experience you were able to keep it just on the verge.

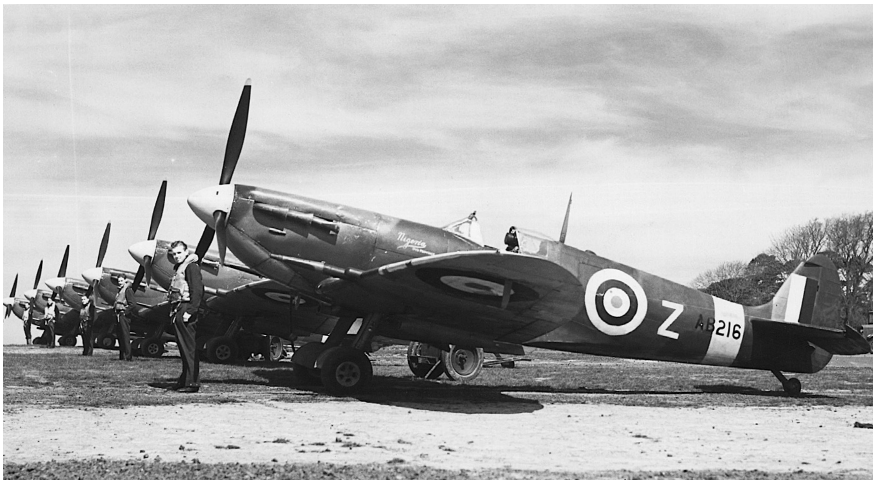
Pilots flying close escort for RAF medium and heavy bombers were now getting a taste of what the *Jagdflieger* had experienced during the latter stages of the Battle of Britain. No one liked these missions. High-scoring ace Sqn Ldr Brendan 'Paddy' Finucane described them simply as 'murder'. Although the more common 'Rhubarbs' did not generate the same levels of trepidation amongst their participants, they were still unpopular due to the increasing levels of flak they generated. Biggin Hill wing leader Wg Cdr Al Deere described them as 'useless and hated'. He noted that at best they 'served only as a means of letting off steam in that they enabled pilots to fire their guns in anger, more often than not against some unidentified target'.

Sqn Ldr Dennis Armitage, CO of the newly formed No. 129 Sqn at Tangmere in the early autumn of 1941, stated that the offensive 'wasn't like fighting a battle on your home ground. It seemed to us very pointless. It was a political, psychological exercise so that the French could see British aircraft overhead. I didn't enjoy it. I didn't enter into the spirit of it in the same way as I had the Battle of Britain.' His aircraft was one of 13 Spitfire VBs, together with a solitary Hurricane, shot down by Bf 109s from JG 26 on 21 September 1941. On that day the Germans claimed 19 for the loss of one 'Friedrich' and its pilot. Armitage was trying to keep his formation together as it flew bomber escort duty for 'Circus 101' when his fighter was hit by an incendiary round. He was forced to bail out into captivity.

Heavy losses continued through to year-end, despite the last 'Circus' (No. 110) having been flown on 8 November, when 17 Spitfires were lost to JG 2 and JG 26. By then JG 26 had been flying Fw 190As alongside its Bf 109Fs for several months and it

Despite his natural ebullience, Hauptmann Hans 'Assi' Hahn was an outstanding fighter pilot and tactician. Under his leadership, III./JG 2 became one of the most successful of the Channel Front *Jagdgruppen*. Hahn would be credited with 26 Spitfires while flying the Bf 109F with III./JG 2. (EN-Archive)

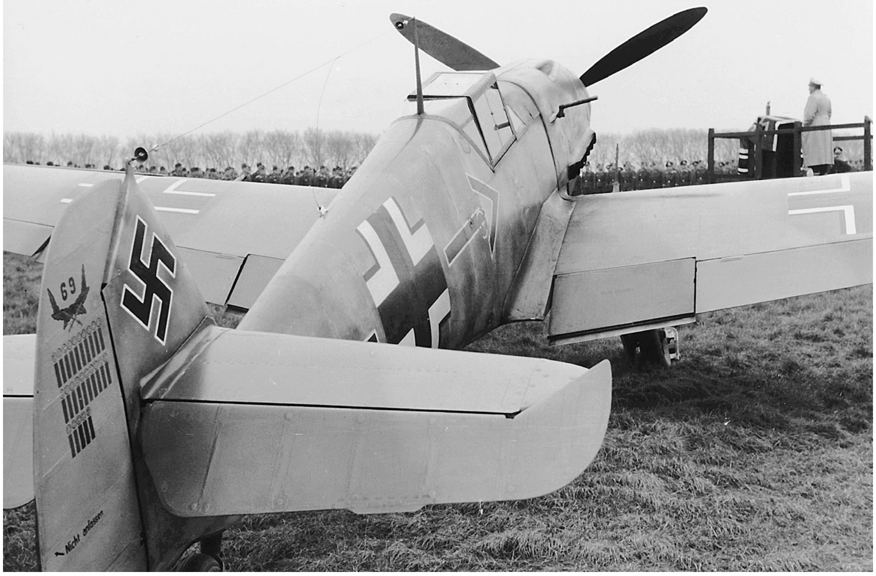
In May 1942 the Air Ministry sent a photographer to Hawkinge, on the Kent coast, to cover the daily operations of No. 91 Sqn (formerly No. 421 Flt). One of the shots he took was this one of 'B' Flight's six Spitfire VBs and VCs neatly lined up for the benefit of the camera. In the foreground is Spitfire VC AB216/DL-Z, which was flown by squadron CO and ace Sqn Ldr 'Bobby' Oxspring, who is standing in front of his fighter. AB216 served with No. 91 Sqn from 15 March 1942 through to 2 June 1943 when it was damaged on operations. (Peter Hall)

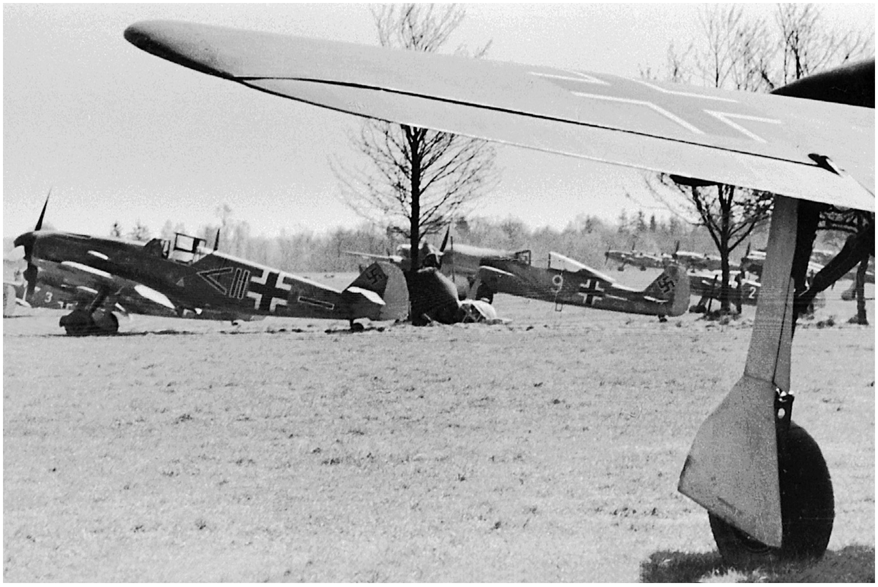


would complete its full conversion to the fighter in the new year. JG 2 remained exclusively equipped with 'Friedrichs', however, and both units formed *Jabo Staffels* with Bf 109F-4/Bs in January 1942. They would attack English coastal targets and convoys throughout the year, running the gauntlet of flak batteries and also No. 91 Sqn (formerly No. 421 Flight) and its Spitfire VBs.

In March the RAF daylight offensive resumed with the advent of better weather. It was hoped that there would be more success and reduced losses due to the increased number of Spitfire squadrons now available and the faster and more capable Douglas Boston bombers supplied via lend-lease replacing the Blenheim IVs. Fighter Command was, however, still feeling the effects of 1941's heavy losses and the posting to the Mediterranean and the Far East of many of its experienced pilots. To make matters worse, the Jagdwaffe was now at its most effective both in terms of tactics and aircraft operated. The Fw 190 was in widespread service and those *Gruppen* still flying the

Two of Oberst Adolf Galland's three specially modified Bf 109Fs were on display during his change-of-command ceremony on 5 December 1941, which was unexpectedly attended by Hermann Göring. The *Reichsmarschall* is seen here at top right paying tribute to Galland's leadership and to the success of his *Geschwader*. This particular aircraft was his one-off Bf 109F-6/U, which had the standard nose armament of a single MG 151/20 20mm cannon and two MG 17 7.92mm machine guns in the nose plus two MG FF/M 20mm cannon in the wings. Galland claimed 13 victories with his trio of 'specials'. (EN-Archive)





From February 1942 II./JG 2 began to re-equip with the Fw 190A-2 at Beaumont-le-Roger. The Bf 109F-4 closest to the camera was assigned to the *Gruppe*'s *Stabsschwarm*, although the fighter does not appear to have been allocated to a specific pilot at that time as it lacks victory bars on its rudder. II./JG 2 had completed its conversion by the spring. (EN-Archive)

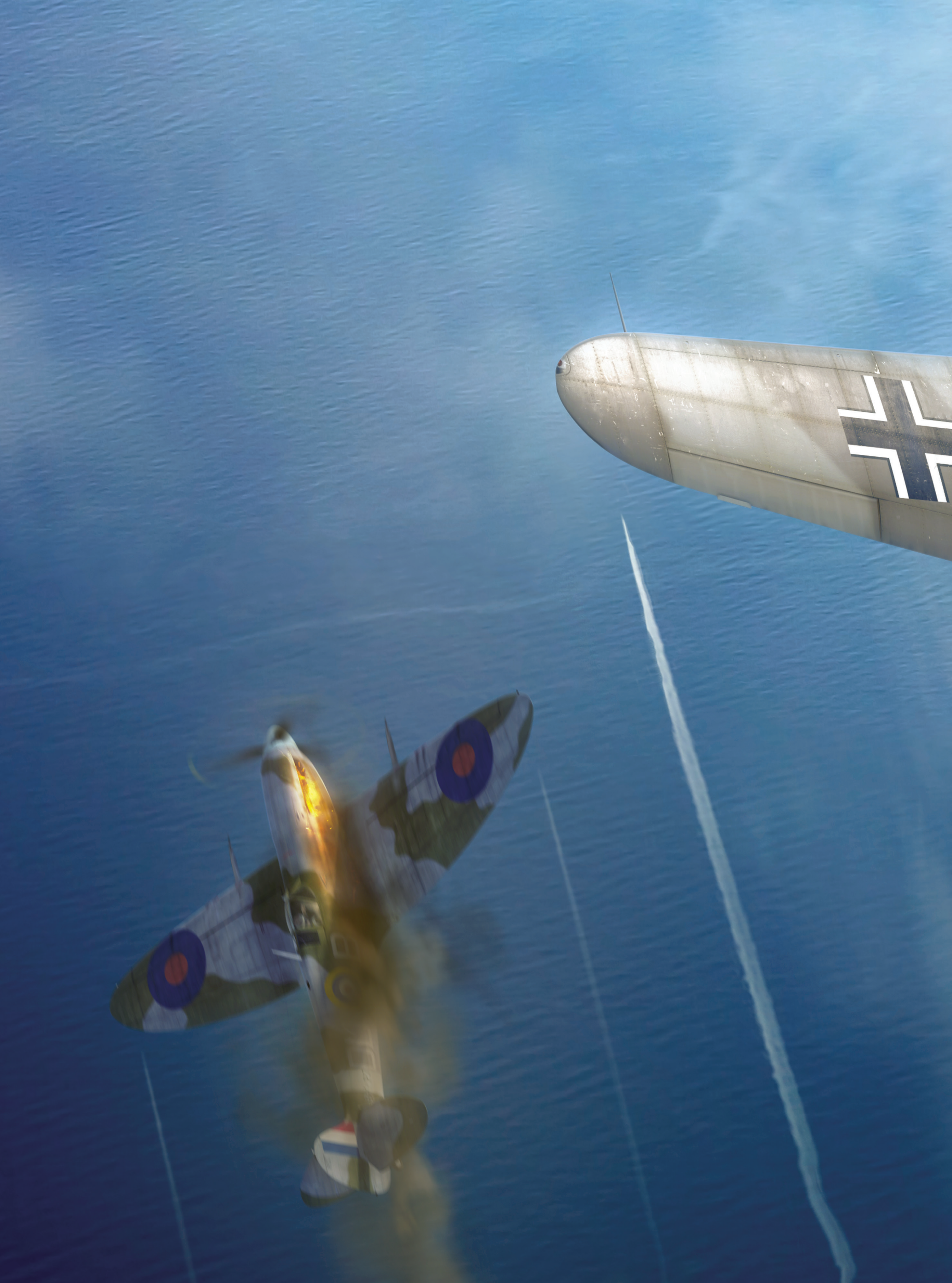
'Friedrich' were equipped with the Bf 109F-4 II, the ultimate F-model to reach the frontline. The pilots of these aircraft had gained valuable experience at little cost to themselves during the aerial battles of 1941, enabling even average pilots to significantly improve their combat skills. As a result, RAF losses were again considerable. During April 1942 four Spitfires were being shot down for every German fighter destroyed. Fighter Command's situation had not improved by the end of June, by which time it had lost 265 aircraft for the destruction of 58 fighters since 8 March.

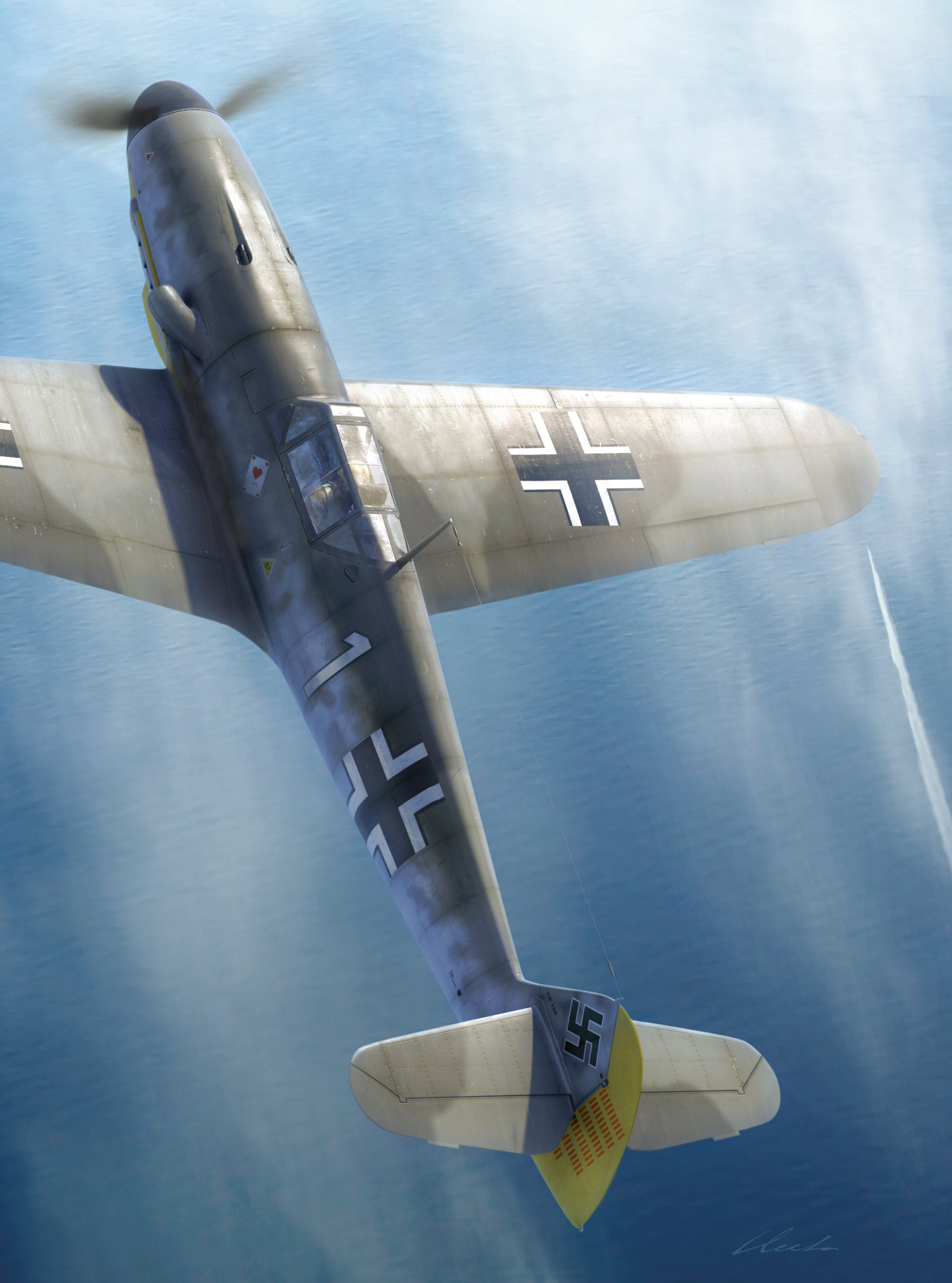
Apart from its *Jabo Staffel* (10(J)./JG 26), JG 26 had by then been fully equipped with Fw 190As. In late July the unit also established 11(*Höhen*)./JG 26 to operate a small number of Bf 109G-1s that had been introduced to provide high-altitude interception of Allied bombers like the USAAF B-17 Flying Fortresses, which would appear over France the following month, and also cover the altitude-limited Fw 190s. JG 2 would follow a similar path, although its final F-4s – serving with I.*Gruppe* – would not be fully replaced by Fw 190s until the end of June. The *Jagdgeschwader* also had a *Jabo Staffel* (10(J)./JG 2) and high-altitude unit 11(*Höhen*)./JG 2 equipped with Bf 109s into 1943.

It is difficult to say with any certainty when a Bf 109F last fought a Spitfire V on the Channel Front. JG 2 suffered its final combat Bf 109F losses on 5 June, when three F-4s were downed by Spitfire VBs from Nos. 72 and 133 Sqns. Part of the Biggin Hill Wing, these units had caught elements of JG 2 climbing away from JG 26's base at Abbeville and heading for Le Havre. The pilots involved claimed three Messerschmitts destroyed and two probables. It would appear that the last JG 26 'Friedrich' to be downed by a Spitfire fell four days later, when a lone Bf 109F-4/B *Jabo* was intercepted by a No. 131 Sqn Mk VB while searching for shipping off Selsey Bill at dusk. From then on, aside from the occasional encounter with a Bf 109G-1, Spitfire units would be exclusively fighting the Fw 190A well into 1943.

OVERLEAF

On 8 November 1941 the RAF mounted its last 'Circus' (No. 110) of the year, and as with most of those that had preceded it, Fighter Command suffered heavy losses in its defence of Blenheim IV bombers at the heart of the operation. Indeed, no fewer than 15 Spitfire VBs and a solitary Mk IIA were lost to enemy fighters. Among the victors was Hauptmann Josef 'Pips' Priller, *Staffelkapitän* of 1./JG 26, who claimed his 57th and 58th successes when he engaged Spitfires off the coast of Gravelines, northeast of Calais. His victims were almost certainly from Australian-manned No. 452 Sqn of the Kenley Wing, which had been tasked with providing high cover for the Blenheim IVs. Both Spitfire pilots bailed out over the Channel and were rescued east of Ramsgate, one of them being high-scoring ace Flt Lt Keith 'Bluey' Truscott. German losses consisted of two Fw 190s destroyed and one pilot killed and three more aircraft damaged.





STATISTICS AND ANALYSIS

Major Walter Oesau, *Kommodore* of JG 2, poses with three of the unit's high-scoring aces during a press day at St Pol in August 1941. At left is Leutnant Egon Mayer, *Staffelkapitän* of 7./JG 2, then Oesau, then Oberleutnant Rudolf Pflanz (*Geschwader* Technical Officer) and Oberleutnant Erich Leie (*Geschwader* Adjutant). Mayer, Pflanz and Leie had all been awarded the Knight's Cross on 1 August 1941 for passing the 20-victory mark. Between them these four pilots claimed an astonishing 117 Spitfire II/Vs shot down in 1941–42. (EN-Archive)

Following Fighter Command's success in the Battle of Britain, the popular conception among the Allies at the time was that the Hurricane and, in particular, the Spitfire were vastly superior to the Bf 109E. The fallacy behind this belief was glaringly exposed during the Channel Front offensive of 1941–42, although misleading statistics on the number of Luftwaffe fighters shot down during this period masked that fact during the war. Close study of German losses reveals that Fighter Command's over-claiming had started in May 1940 when RAF pilots claimed to have shot down three times as many aircraft over Dunkirk as they had actually destroyed. Despite bellicose national newspaper headlines during the Battle of Britain, RAF fighter losses had, in fact, been substantially higher than Bf 109 losses.

The bulk of the victories claimed by the Jagdwaffe in 1941–42 were credited to JG 2 and JG 26, which were the sole fighter units remaining on the Channel Front from early June 1941. By any measure, their record for this period is an impressive one. The confirmed claims for all *Jagdgeschwader* in the West in 1941 totalled about 950 aircraft, with the bulk of victories credited to JG 2 and JG 26. For the second half of the year these two units rarely had more than 150 serviceable fighters at their disposal at any one time. Yet according to Fighter Command, it lost 849 fighters that year, thus proving that the *Jagdfliegers'* claims were reasonably accurate. British claims, conversely, were optimistic to say the least. Fighter pilots received confirmation for 775 victories during 1941, while Jagdwaffe records reveal that actual losses from all causes during the year totalled 236. Only 103 of these aircraft were destroyed in combat, reflecting the fact that the Bf 109 was notoriously difficult to handle during takeoff and landing, particularly on the austere airfields of northern France.

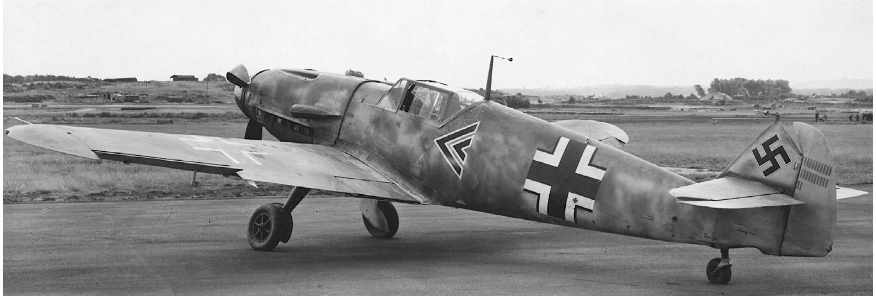
The RAF first got an inkling that its pilots were not perhaps downing as many aircraft as they were claiming during the interrogation of Hauptmann Rolf Pingel, *Kommandeur* of I./JG 26, who was captured after force-landing his Bf 109F-2 near Deal, Kent, on 10 July 1941. A 27-victory ace (who had scored six of his kills in Spain), Pingel told his interrogators that he was pleased the RAF was now operating over France as many German aviators had been lost when they bailed out over England or the Channel. Now, if they were forced to take to their parachutes, they were coming down in friendly territory. He also stated that more than 100 RAF aircraft had been downed over France since the beginning of the year, with German losses totalling between one-fifth and one-third of this number. His own I./JG 26 had claimed close to 50 victories for the loss of just eight pilots. When Pingel was told that Fighter Command had claimed 125 Bf 109s downed in the previous six months, he replied that such losses would have wiped out half the available fighter strength in France. Furthermore, the Jagdwaffe would have been hard pressed to make good such attrition. This explained why JG 2 and JG 26 were still able to oppose the bombing raids in strength – something that had mystified the RAF.

Hauptmann Rolf Pingel, *Kommandeur* of I./JG 26, provided a series of revelations to his interrogators after he crash-landed his Bf 109F-2 near Deal on 10 July 1941. The 27-victory ace was almost certainly brought down by return fire from the Stirling bomber he had chased back across the Channel. (John Weal)

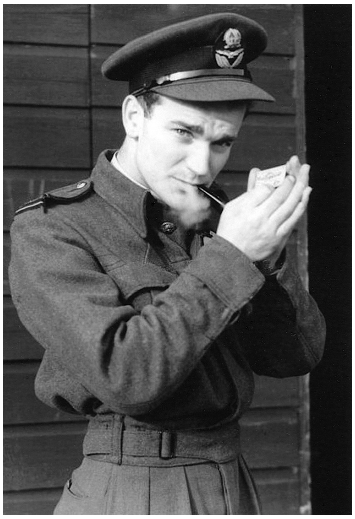
Following the German invasion of the Soviet Union on 22 June 1941, the British had been encouraged by their new communist allies to step up the RAF's offensive over France in an attempt to force the Luftwaffe to transfer fighters from the Eastern Front to combat the RAF's daylight raids. Pingel's statements during his interrogation clearly showed that the Allies had failed to achieve this, and also that he considered the supposedly weak German opposition in France to be a great temptation for the RAF to maintain its high tempo of operations and so lose more pilots.

Despite Pingel's revelations, Fighter Command kept up its Non-Stop Offensive throughout July, flying 525 sorties (including 400 on 'Circus' operations) and claiming 185 enemy aircraft destroyed. The cost was 97 pilots killed, captured or missing. Another 98 were lost the following month.

The topic of over-claiming was examined by historian Norman Franks in his book *Fighter Command's Air War 1941*:



Hauptmann Pingel's F-2 Wk-Nr 12764 was recovered by the RAF and quickly repaired. It was subsequently test-flown in mock combat with RAF fighters until it was written off in a fatal crash on 20 October 1941. (Philip Jarrett)



RAF fighter pilots could claim an enemy aircraft destroyed, probably destroyed or damaged. If confirmed as destroyed it had to have been witnessed by an independent person and seen to crash, crash in flames, break up in the air, or the pilot take to his parachute. If it merely fell or spun away out of sight trailing smoke or flame but was not actually seen to crash, blow up or its pilot bail out, then it was a probable. Even if the victorious pilot reported it had crashed but had no witnesses to the event, the squadron intelligence officer could only give credit for a probable, although it became obvious that certain pilots – those with a track record for shooting down enemy machines – were often given credit.

The German pilots had similar categories of victory credits, especially the confirmation by another pilot or ground observer. However, neither side, obviously, kept to these rules, as witnessed by the number of claims and credits against actual losses. It was generally a case of the head seeing what the eye did not. If a pilot was convinced that his opponent had been destroyed, even if he had to admit to himself he had not actually seen it, he might easily report it destroyed because he could not believe it could have survived the damage he had inflicted.

The problem of speed also contributed to over-confidence in claiming a victory. A pilot could have fired at an opponent and then taken his eyes from it to check his own safety, before looking back and seeing what he assumed to be the aircraft he had just attacked crash. The speed of combat meant that a pilot very quickly exited the immediate combat zone. It was this more than anything else, especially in a fight where there were several aircraft of both sides involved, that one falling aircraft could become the 'victory'

LEFT
The first pilot to achieve success in a Spitfire in 1942 was Free French ace Flt Lt Jean-Francois 'Moses' Demozay of No. 91 Sqn, who shot down a Bf 109 off Boulogne at 1230 hrs on 1 January to claim his 15th victory. He was credited with six Bf 109Fs destroyed in a final tally of 18. (Peter Hall)

RIGHT
The leading Spitfire ace in terms of Bf 109Fs destroyed was the diminutive Irishman Wg Cdr Brendan 'Paddy' Finucane, who claimed 13 and two shared while serving with Nos. 452 and 602 Sqns – both units were part of the Kenley Wing. Promoted to Hornchurch wing leader in late June 1942, he was forced to ditch in the Channel after his fighter was hit by flak on 15 July. No trace of Finucane's body was ever found. (Chaz Bowyer)

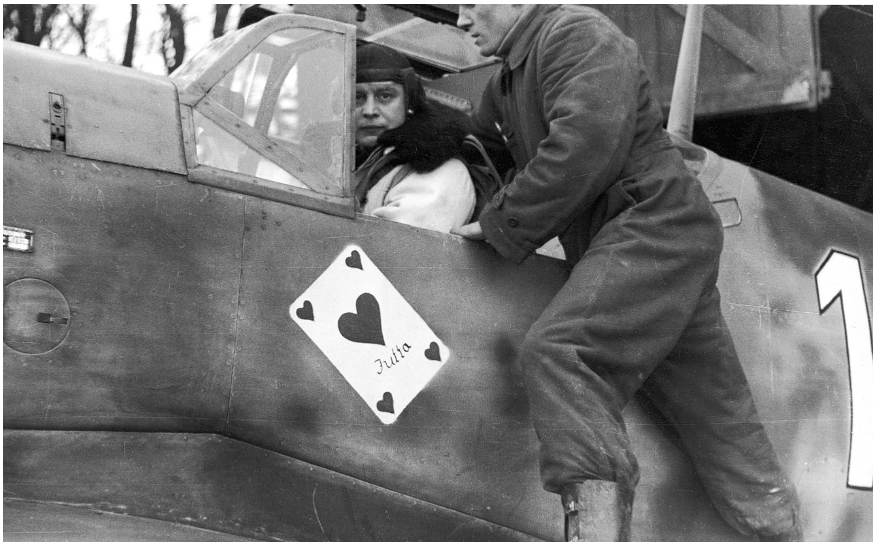
Leading Bf 109F Spitfire II/V Killers

	Victories	**Final Score**	**Unit(s)**
Oblt Siegfried Schnell	40	83	4. and 9./JG 2
Oblt Rudolf Pflanz	38	52	*Stab.* and I./JG 2
Oblt Egon Mayer	37	102	7./JG 2
Hptm Josef Priller	36	100	1./JG 26
Hptm Johann Schmid	32	40	*Stab.* and 8./JG 26
Obslt Adolf Galland	28	100	*Stab.* JG 26
Oblt Erich Leie	28	121	*Stab.* JG 2
Hptm Hans Hahn	26	105	III./JG 2
Ltn Erich Rudorffer	18	219	2. and 6./JG 2
Ofw Josef Wurmheller	17	103	5./JG 53 and I. and II./JG 2

Leading Spitfire II/V Bf 109F Killers			
	Victories	**Final Score**	**Unit(s)**
Wg Cdr 'Paddy' Finucane	13 (+2sh)	26 (+6sh)	Nos. 452 and 602 Sqns
Wg Cdr 'Jamie' Rankin	12	17 (+5sh)	No. 92 Sqn and Biggin Hill Wing
Wg Cdr 'Sailor' Malan	9	27 (+7sh)	No. 74 Sqn and Biggin Hill Wing
Sqn Ldr 'Bluey' Truscott	9	14	No. 452 Sqn
Wg Cdr 'Micky' Robinson	8	16	No. 609 Sqn and Biggin Hill Wing
Wg Cdr Douglas Bader	6	20 (+4sh)	Tangmere Wing
Sqn Ldr Jean-Francis Demozay	6	18	No. 91 Sqn
Flg Off Don Kingaby	5	21 (+2sh)	No. 92 Sqn
Flg Off Adolf Pietrasiak	5	7 (+4sh)	Nos. 92 and 308 Sqns
Flg Off 'Johnnie' Johnson	4 (+2sh)	34 (+7sh)	Nos. 616 and 610 Sqns

> of several pilots. And if an aircraft was seen to fall into the sea or crash several thousand feet below, it was easy to say that it was a German aircraft when, in fact, it might well have been a British one.

Fighter Command's propensity for over-claiming decreased somewhat in 1942, while the Jagdwaffe's force levels remained much the same as they had done the previous year. The RAF continued with its daylight offensive, allowing JG 2 and JG 26 to claim 972 victories during the course of the year. Fighter Command's losses totalled 915 aircraft. The RAF, however, claimed 560 German fighters destroyed on the Channel Front, but only 272 aircraft were actually lost to all causes, not just combat.



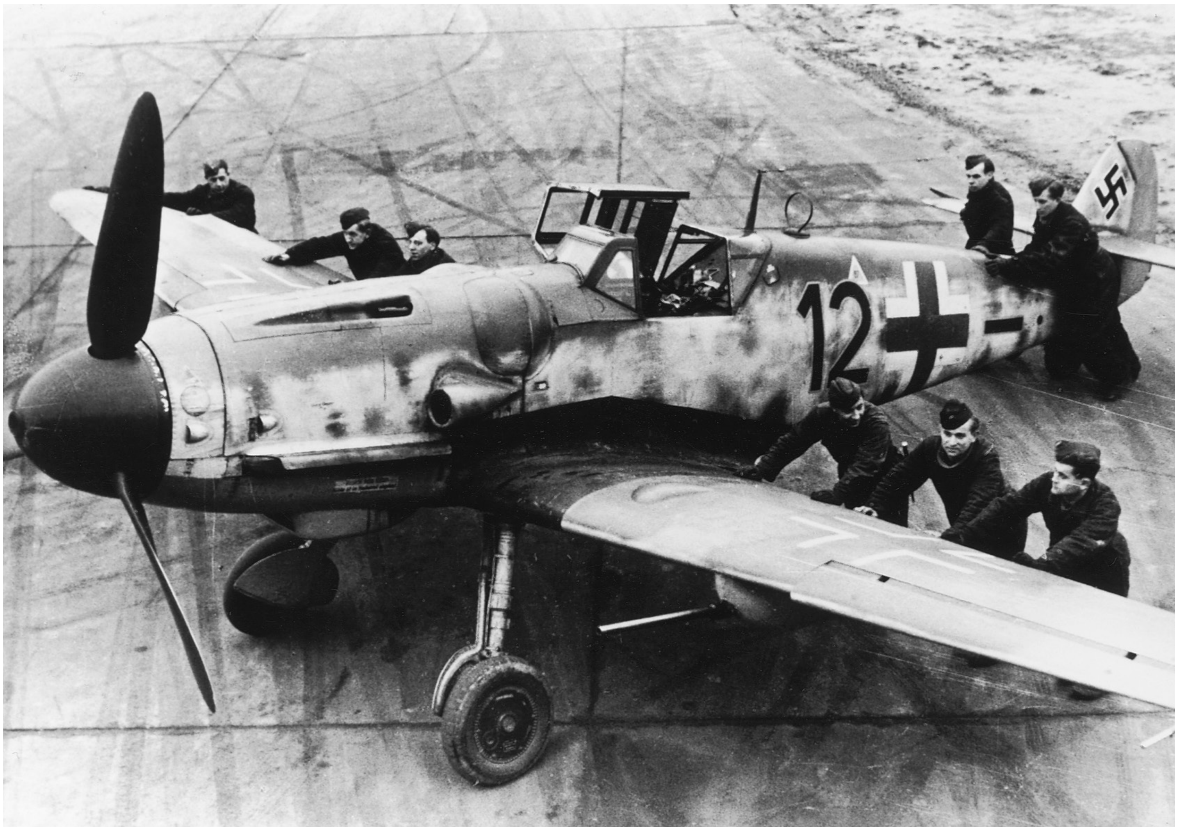
Perhaps caught at the wrong moment, an unusually sombre Oberleutnant Josef Priller, *Staffelkapitän* of 1./JG 26, peers grumpily from the cockpit of his Bf 109F-4 as a groundcrewman helps him prepare for his next sortie from St Omer-Clairmarais sometime in the autumn of 1941. Soon to be exchanged for an Fw 190, this 'Friedrich' – like all of Priller's fighters – carries his personal insignia below the cockpit: an ace-of-hearts bearing his wife's name, Jutta. Priller would claim 36 Spitfire II/Vs destroyed with the Bf 109F in 1941. (John Weal)

AFTERMATH

Although all Bf 109Fs had disappeared from frontline units on the Channel Front by the autumn of 1942, the Spitfire VB would soldier on with Fighter Command well into 1944. Indeed, the better performing Spitfire IX had started to roll off the production line in mid-1942, yet the venerable Mk V still dominated Fighter Command's order of battle in the summer of 1943. By then the less than effective 'Circus' operations were a thing of the past, having been replaced by 'Ramrod' missions – an attack by a large force of bombers or fighter-bombers expressly tasked with destroying targets. The specific role of escorting fighters on such missions was to protect the bombers from the Jagdwaffe. No fewer than 18 of the 32 Spitfire squadrons which supported 'Ramrod S.36' on 6 September 1943 were flying Mk Vs.

The fighter was outclassed at high altitude – the domain of the Bf 109G, increasing numbers of which were appearing in the West by the summer of 1943 – but the low-altitude-optimised Spitfire LF V remained a formidable opponent below 6,000ft. With its 'M' series Merlin engine equipped with a cropped supercharger impeller, it was as fast as an Fw 190A at this altitude and faster than a Bf 109G.

As previously noted, a small number of pressurised Bf 109G-1s had been issued to both JG 2 and JG 26 in July 1942 just as the last of the 'Friedrichs' were being replaced by Fw 190As. The arrival of the high-altitude Messerschmitts coincided with the escalation of daylight raids by B-17 and B-24 heavy bombers of the US Eighth Air Force. The Luftwaffe high command was not slow to realise that the USAAF would pose a serious threat once its strength had built up at bases in eastern England and sufficient high-flying escort fighters (albeit then still lacking in range for deep-penetration missions) had been shipped in from the USA. Although the well-armed Fw 190s then in service on the Channel Front were ideal anti-bomber platforms, the fighter's performance degraded sharply at high altitude. What was needed was a



purpose-built interceptor to engage the bombers en route to their targets. Just such a fighter was about to enter service – the Bf 109G-4.

Before 1942 was out, both JG 2 and JG 26 were operating a mix of Fw 190As and Bf 109G-4s. Eventually, II./JG 2 and III./JG 26 would totally re-equip with the 'Gustav', the Messerschmitt fighter remaining with these *Gruppen* until the final months of the war when they converted to the Fw 190D-9.

Throughout 1943 and the early months of 1944, while still expected to challenge the RAF's sweeps into the airspace over northwest Europe, the Bf 109G pilots of II./JG 2 and III./JG 26 would find themselves increasingly opposing the USAAF 'heavies' and their P-38 Lightning, P-47 Thunderbolt and P-51 Mustang escorts. In effect, these two *Gruppen* formed the first line of defence in what was developing into the Battle of the Reich.

How many mechanics does it take to push a 'Gustav'? Eight, if this photograph is anything to go by. 5./JG 2's Bf 109G-6 'Black 12' would be lost in action on 20 October 1943. Both JG 2 and JG 26 were operating a mix of Fw 190As and Bf 109G-4s by the end of 1942. Eventually, II./JG 2 and III./JG 26 would totally re-equip with the 'Gustav', the Messerschmitt fighter remaining in service with these *Gruppen* until the final months of the war when they converted to the Fw 190D-9. (John Weal)

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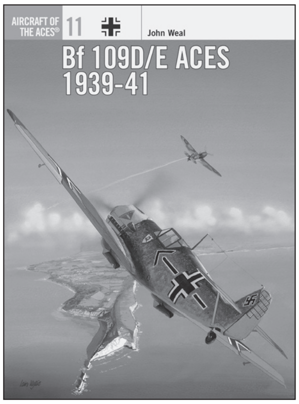
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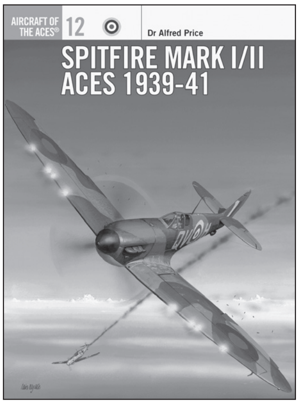
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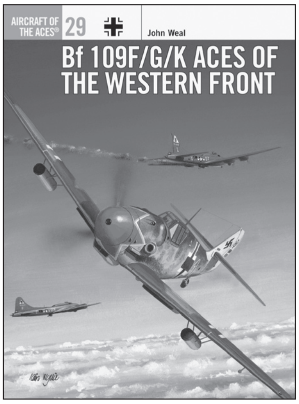
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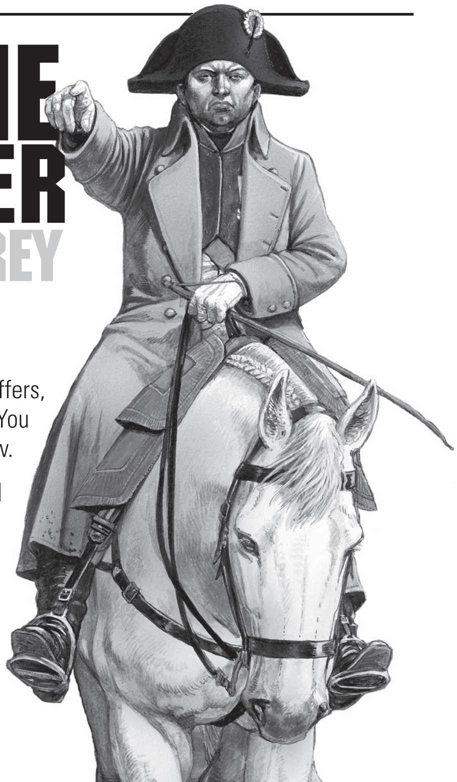

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